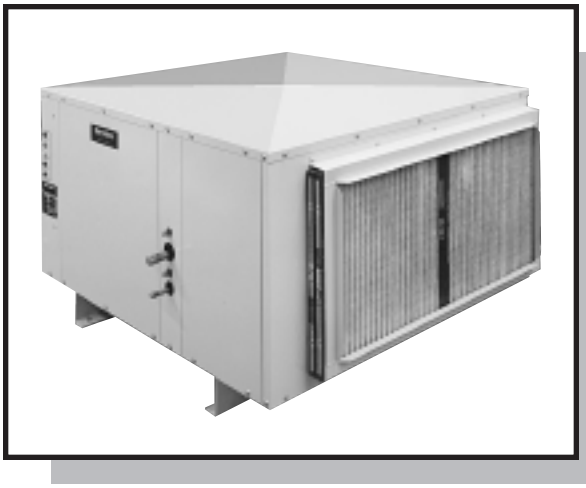
DryAire™
SYSTEMS

DEHUMIDIFIER INSTALLATION & OPERATION MANUAL

For Models:
DRY-10-SERIES
DRY-20-SERIES
DRY-25-SERIES
DRY-30-SERIES
DRY-40-SERIES
DRY-50-SERIES

OC-10-SERIES
OC-20-SERIES
OC-25-SERIES
OC-30-SERIES
OC-35-SERIES
OC-40-SERIES
OC-45-SERIES
OC-50-SERIES

DRY-10-V SERIES
DRY-20-V SERIES
DRY-30-V SERIES



SP-901

CAUTION

CAUTION: Only trained, qualified service technicians should attempt installation, or repair of DryAire dehumidification equipment. Danger of high voltage components and refrigerant under pressure are present. Serious injury, death and property damage can result from improper installation or service of DryAire equipment.

LIMITED WARRANTY

The goods manufactured by seller are warranted to be free from all defects in material and workmanship which may be disclosed under normal use and service for twelve months from date of start-up, not to exceed fourteen months from date of shipment. In order for warranty to be valid, a START-UP REPORT must be completed and returned to the factory. If the report is not sent back, warranty will be voided on the equipment. If it is found that the goods contained defects at the time such goods were furnished by the seller, seller will either repair or replace the part or parts at sellers option. This warranty to repair or replace is the exclusive remedy and is expressly limited to the materials furnished by the seller. All replacements or repairs shall be shipped freight collect from Germantown, WI. The seller shall not be liable for labor cost incurred in diagnosing the problem, in removal or replacement of the part or parts so repaired or replaced. Accordingly, seller shall not be liable for any consequential damages, whether to person or property, caused by defects in goods. This warranty does not apply to any goods which may have been repaired or altered in any way outside of our factory, so as to affect its stability in our judgement, nor does this warranty apply to any goods which have been subjected to misuse, negligence or accident. This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability and extends only to the original purchaser.

IMPORTANT: In order for warranty to be valid, a START-UP REPORT must be completed and returned to the factory. If the report is not sent back, warranty will be voided on the equipment.

Return Report to: Attn: Technical Svc Group
DRYAIRE SYSTEMS CORPORATION
W185 N11497 WHITNEY DRIVE
GERMANTOWN, WI 53022

Fax: 262-250-0886

TABLE OF CONTENTS PAGE

1.0. Installation....4
- 1.1. Product Overview....4
- 1.2. General Information....4
- 1.3. Unpacking and Inspection....5
- 1.4. Location and Space Requirements....5,6
- 1.5. High Voltage Electrical Connections....7
  - 1.5.1. Wiring and Fuse Sizing....7
  - 1.5.2. High Voltage Power Connections....8
- 1.6. Control Wiring and Location
  - 1.6.1. Control Package DH-46 and ME-52....8
  - 1.6.2. Controller Location....9
  - 1.6.3. Non-Standard Control Package....9
- 1.7. Condensate Drain Piping....10
  - 1.7.2. Condensate Piping Diagram....10
- 1.8. Pool Water Evaporation 11
- 1.9. Preventing Condensation....11

2.0. Air Distribution....11
- 2.1. Ducted Air Systems....11
  - 2.1.2. Duct Layout Example #1....12
  - 2.1.3. Duct Layout Example #2....13
  - 2.1.4. Duct Layout Example #3....13
- 2.2. Prevent Air Stratification....14
- 2.3. Non-Ducted Installation....14
- 2.4. Outdoor / Make-Up Air Application....14
  - 2.4.1. Outdoor Air Diagram....14
- 2.5. Supplemental Heat....15
  - 2.5.1. Duct Heater Diagram....15
- 2.6. Outdoor Installation....15

3.0. Outdoor Remote Condenser (Optional)....16
- 3.1. Outdoor Remote Condenser Installation....16
  - 3.1.1. Refrigerant Piping Remote Condenser....16
  - 3.1.2. Refrigerant Piping Dehumidifier....16
  - 3.1.3. Remote Condenser Charts & Diagram....17
  - 3.1.4. Piping Construction....18
  - 3.1.5. Piping Leak Check....18
  - 3.1.6. Evacuation of Remote Condenser....18
  - 3.1.7. Charging Remote Outdoor Condenser....18
- 3.2. Electrical Data / Fuse Size....19

DRY-10 Series Specifications....19
DRY-20 Series Specifications....20
DRY-25 Series Specifications....20
DRY-30 Series Specifications....20
DRY-40 Series Specifications....20
DRY-50 Series Specifications....21
DRY-10-V Series Specifications....21
DRY-20-V Series Specifications....21
DRY-30-V Series Specifications....21

TABLE OF CONTENTS PAGE

3.3. Control Wiring Diagram #1....22
3.4. Control Wiring Diagram #2....23
4.0. Head Pressure Controller/Outdoor Remote Condenser....24
4.1. Low Ambient Head Pressure Control....24
5.0. System Air Flow....24
5.1. Excessive Air Flow Problems....24
5.2. Inadequate Air Flow Problems....25
5.3. Drive Pulley Data....25
5.4. Drive Pulley Adjustment....25
6.0. Start-Up Procedure....26
6.1. Prior to Start-Up....26
7.0. Operational Sequence....26
System Refrigeration Flow Diagram....27
7.1. Systems Mode of Operation....28
7.1.1. De-humidification / Air Reheat Mode....28
7.1.2. De-humidification / Air Cooling Mode....28
7.1.3. Blower Operation....28
7.2. Power On!....28
7.2.1. De-humidistat Control Setting....28
7.2.2. Inlet and Outlet Air Readings....28
7.2.3. Thermostat Set-Points....29
7.2.4. Motor Operation....29
7.2.5. Pressure Readings....29
8.0. Start-Up Report Procedure....29
9.0. Maintenance Procedure....29
9.1. Monthly Inspection....29
9.2. Six Month Inspection....30
10.0. Trouble Shooting Section....30
10.1. Unit Will Not Operate....30
10.2. Condensation on Walls....30
10.3. Evaporator Coil Freeze....31
10.4. Head Pressure Too High In Cooling Mode....31
11.0. Service Diagnosis Chart....32,33
12.0. Unit Operating Guidelines....34
12.1. Controller Set-Points....34
12.2. Refrigeration Pressures....34
12.3. Temperature Rise....34
12.4. Pool Water Chemistry....34
13.0. SMACNA Duct Design Data....35
14.0. Outside Air Pre-Heating Requirements....36
15.0. Compressor Failure Procedure....36
15.1. Mild Compressor Burn-Out....37
15.2. Severe Compressor Burn-Out....37
16.0. Refrigeration Charts....38
17.0. Start-Up Report Copy....39

1.0 Installation

1.1. Product Overview

The DryAire dehumidifier is a very high capacity, self contained dehumidifier that is manufactured by qualified personnel. Many years of extensive field experience have contributed to the design for simple, low maintenance operation and easy installation.

Should you have any questions regarding installation, or operation, please contact the factory and request assistance from the Technical Services Group.

1.2. General Information

During the initial design stage of the indoor swimming pool enclosure, architectural and mechanical consideration must be given to determine the materials best suited and acceptable to this type of environment. The water temperature, air temperature, relative humidity and the resulting dew point temperature should be calculated to aid in the design of the wall and roof structure.

DryAire recommends particular attention be given to the proper design of the vapor barrier, thermal bridges and insulation of the structure. Any defect in the vapor barrier or lack of barrier, can cause operating complications and costly building deterioration.

Any interior window glass, skylight or building surface which is allowed to drop below the design dew point temperature will have a tendency to condense moisture.

Remember, to eliminate condensation, you must always maintain material structures well above the design dew point temperature.

See “Ducted and Non Ducted” air systems in this installation manual for additional information.

For this reason, DryAire highly recommends that the warm dry air leaving the dehumidifier be distributed to a perimeter type air supply system. The resulting performance of the dehumidification system is primarily a function of the actual operating and installation condition.

Caution

Danger of electrical shock and R-22 refrigerant are under pressure. Only trained service technicians should attempt installation or any repair of the DryAire equipment.

1.3. Unpacking and Inspection

DryAire performs several physical inspections and multiple tests on each dehumidifier during and after the various production stages to insure you receive the best quality piece of equipment available. Upon delivery, check the shipment thoroughly for both visible and concealed transportation damage before you sign the delivery receipt. Be sure to document any damage in writing on the carrier's bill of lading. If the equipment is damaged, obtain a claim form from the carrier, fill out the form, return the form promptly to the carrier and notify DryAire of any damage.

1.4. Location of Dehumidifier

Sufficient service access must be provided for the removable panels electrical wiring, ductwork and condensate drain piping. A minimum of 36 inches of clearance around all sides of the dehumidifier should be provided. Install the unit on a sturdy, level trapeze type hanging system or a mounting platform that will prevent vibration and sound transmission. Avoid the use of materials such as wood or plywood for construction of support base or stand. Machine vibration pads (field supplied) should be installed under the dehumidifier to prevent any excessive operating noise. Do not install the unit above a swimming pool or near occupied rooms such as bedrooms. Do not attempt to conserve installation space by fabricating restrictive ductwork with abrupt bends.

FIELD FABRICATED SUPPORT BASE METHOD

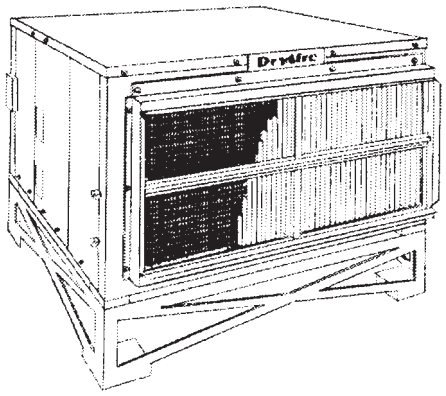


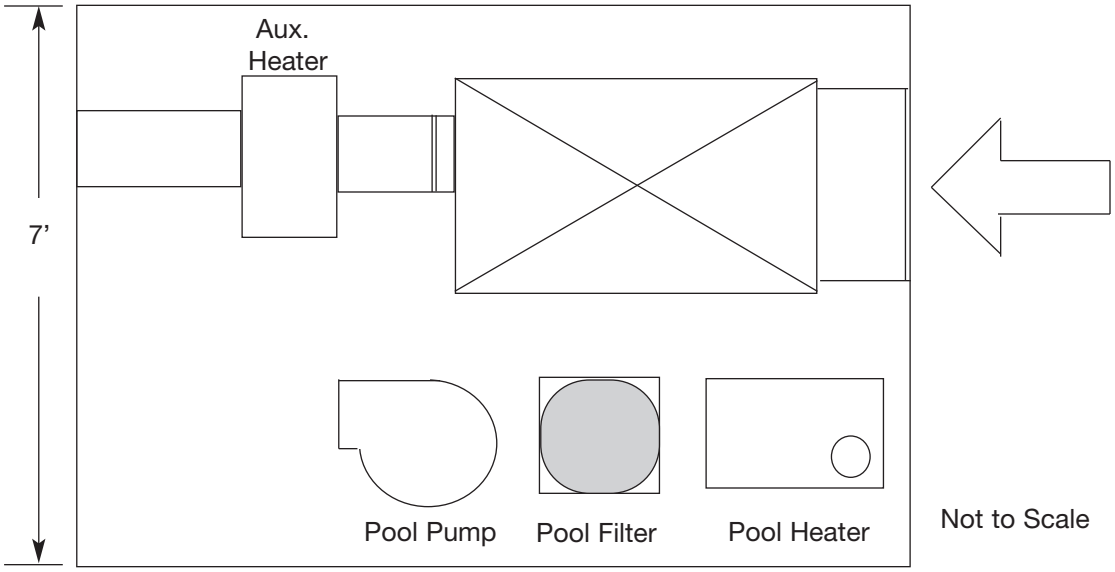
Figure 1.

1.4.1 Location and Space Requirements for Mechanical Room

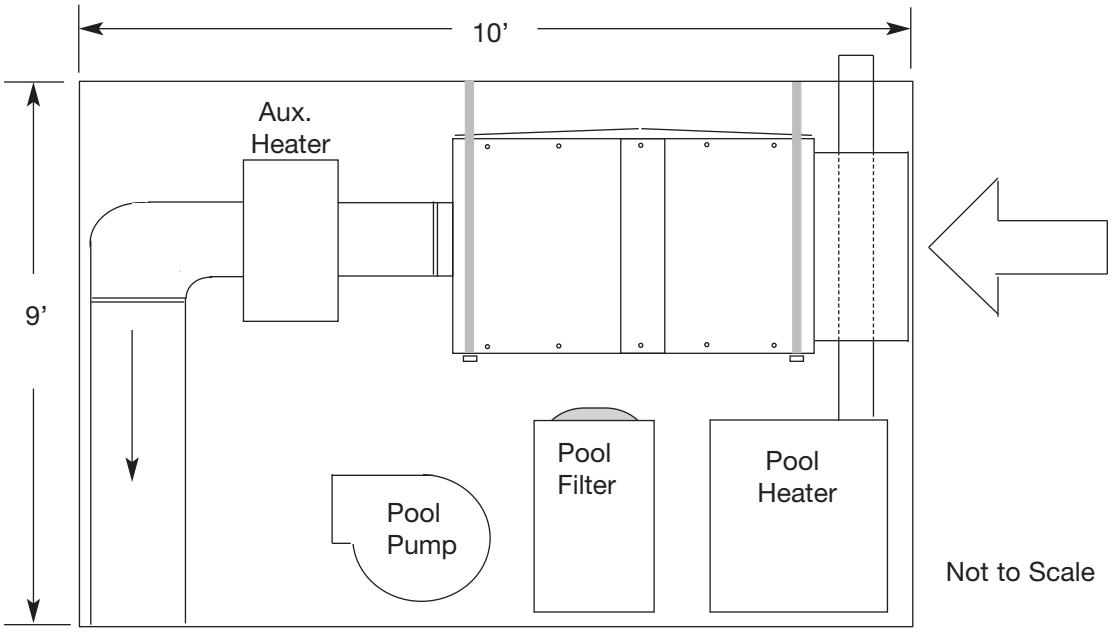
As a general guide, a DRY-10, DRY-20, DRY-25, DRY-30 dehumidifier located in a mechanical room should be installed in an area approximately 10’ long 7’ wide and 5’ or 9’ high depending on placement. This will allow sufficient room for the contractor to install ductwork, condensate piping, aux. heat and adequate space for service.

The diagrams show below grade duct or soffit type supply duct and a single, high return duct along with an auxiliary duct heater if needed to maintain total heating capacity at design condition.

A dehumidifier can recover approximately 12,000 to 30,000 gallons of water per year based on the size of the pool. Water can be very expensive in some parts of the country and if local code permits, this soft water can be returned to the pool through the inlet skimmer for chemical and filter treatment.



TOP VIEW MECHANICAL ROOM



SIDE VIEW MECHANICAL ROOM

CEILING SUSPENDED INSTALLATION

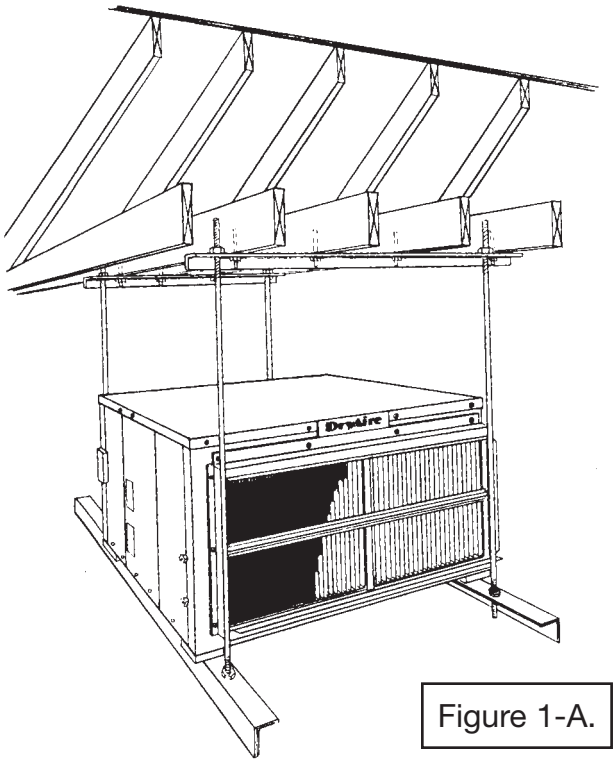


Figure 1-A.

Do not install a standard dehumidifier in an unconditioned space or where ambient temperatures can fall below 45°F.

If you must install the dehumidifier outside or in an unconditioned space, such as an attic, you must use an outdoor rated dehumidifier. DryAire equips all outdoor rated dehumidifiers with proper weatherproofing and thicker insulation. A label located on the electrical panel door will identify an outdoor prep dehumidifier. (See Section 2.6 for details).

1.5. High Voltage Electrical Connections

THE INSTALLING CONTRACTOR MUST VERIFY THAT ALL ELECTRICAL WIRING TO THE DEHUMIDIFIER AND ITS ACCESSORIES COMPLIES WITH NATIONAL, STATE AND LOCAL CODES.

1.5.1. Wire and Fuse Sizing

The field-installed power supply wires and over current devices must be sized to handle the minimum ampacity of the dehumidifier without exceeding the maximum fuse size rating. Both the minimum ampacity and the maximum fuse size are listed on the unit rating plate.

The grounding wire size must be the same or larger than the supply wire size. Provide an uninterrupted grounding source to prevent the possibility of injury.

Failure to properly wire the dehumidifier will create the possibility of electrical shock and may ultimately lead to premature system failure.

1.5.2. High Voltage Power Connections

On single phase dehumidifiers, the power supply will have 3 wire connections, (2 power, 1 ground). On the three phase dehumidifier, power supply will have 4 connections, (3 power, 1 ground). Connect to main power block located in the upper right hand corner of the electrical compartment.

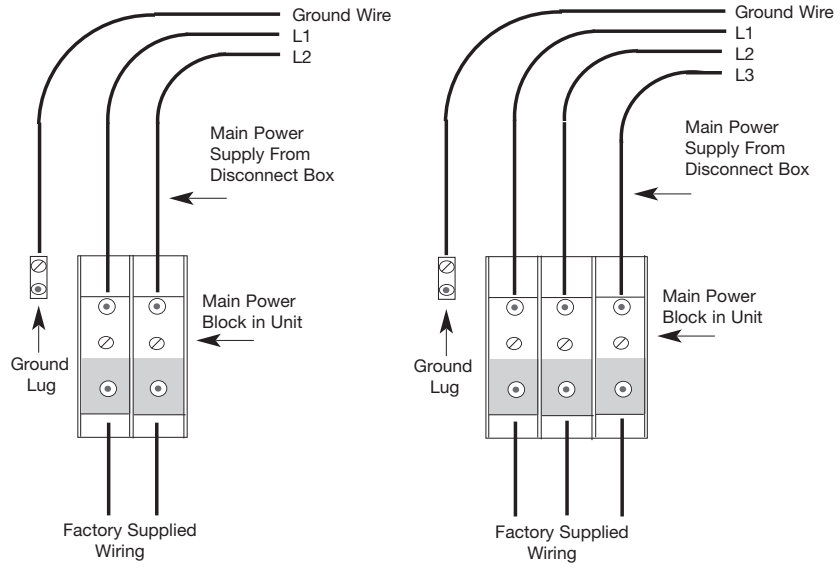


Figure 2. Single Phase and Three Phase Power Connections.

1.6. Control Wiring and Location

The controls provided with the DryAire dehumidification systems are manufactured by Honeywell® Control Products Group.

1.6.1. Control Package DH-46 and ME-52

These Honeywell® controllers are snap action type de-humidistat and a micro-electronic automatic change-over thermostat with the sensors built-in. You must mount the controllers in the conditioned environment.

1.6.2. Controller Location

Standard low voltage (24 volt) AC wiring, such as that used with standard air conditioning equipment, is required for the 24 volt controls of the dehumidifier. A (2) wire low voltage de-humidistat control is required for all installations. A six (6) wire low voltage connection is required for operation of the optional automatic change-over thermostat.

The de-humidistat and the optional temperature controls should be located in an area of natural room air circulation usually near the return air inlet of dehumidifier.

Do not locate the dehumidifier controls in areas that allow little air circulation or have exposure to the direct sunlight, draft, stagnant areas or exterior walls. The thermostat and de-humidistat must be located approximately five (5) feet above floor level on an interior wall.

Note: If the system is equipped with a remote condenser, leave the thermostat in the 'AUTO' mode. Adjust the set point to 80°F for heating and 84°F for cooling. This will allow the automatic cycling of the unit between heating and cooling modes. Be sure jumper wire has been installed in thermostat. The micro-electronic thermostat requires changes made in the set-up menu.
(Refer to electrical control diagram Page 23.)

If you have a dehumidifier only (no remote condenser) refer to wire diagram on page 22 for alternate terminal pole connection.

1.6.3. Non-Standard Control Package

If your application does not use the standard controller, refer to the documentation which accompanied your control package.

Note: If you use a non-standard controller to energize an auxiliary heater, you may need to install isolation relays between the heater and the controller.

Failure to isolate electrical circuits can result in damage to the dehumidifier and accessory equipment.

1.7. Condensate Drain Piping

1.7.1. Check state and local codes for approved methods of condensate disposal.

A condensate pipe connection is provided in the base of the dehumidifier which must be raised a minimum of 12” above the floor to allow clearance for the condensate drain line. You must install a P-trap on the 1” MPT drain line which is provided for your convenience. Slope the drain line a minimum of 1/4” per linear foot and support piping with code approved hangers and mounting brackets every 5 feet. If drain runs through an unconditioned space you must install heat tracing to prevent freezing.

Note: When the supply blower is operating, the inside of the dehumidifier is under a negative pressure. If you do not trap the drain line, condensate will be drawn into the cabinet of the dehumidifier, which may cause premature corrosion and property damage.

A field supplied condensate pump can be installed for those unusual installations where gravity disposal of condensate drain water is not possible. Follow the manufacturers instructions for installation. Failure to properly install the condensate piping will cause water to stay in the drain pan.

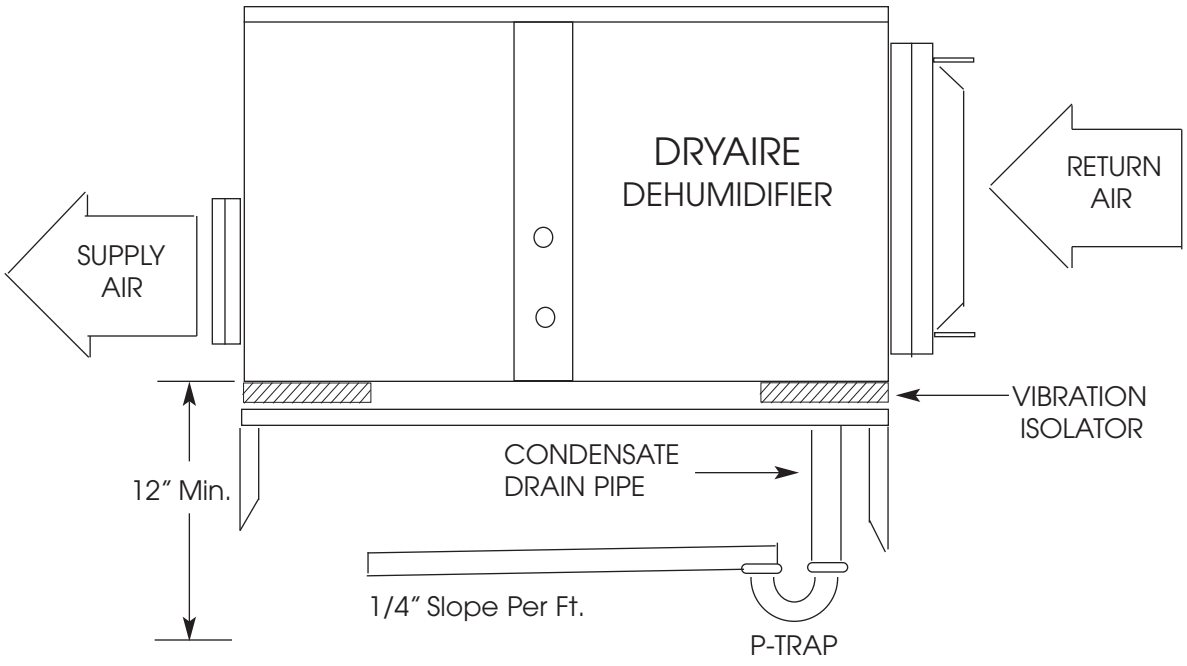


Figure 1.7.2. Condensate Drain Piping

1.8. Pool Water Evaporation

The air velocity directly above and close to the pool water surface must be kept below (10) ft. per / minute. Higher air velocities can easily double or accelerate the evaporation rate of the pool, which greatly reduces humidity control efficiency and increases energy consumption.

1.9. Prevent Condensation

The quantity of supply air and the air velocity from the air distribution system must be sufficient to blanket areas with low R-values, and especially the exterior glass components, with warm dry air. Glass on exterior walls in an indoor pool presents a special problem. Most exterior glass is very susceptible to condensation when the outdoor temperature is low. The design goal is to keep all the surfaces of the glass at least five (5°F) above the pool room dew point temperature. Supply air must be blown directly onto the entire surface of the glass using linear diffusers in order to prevent condensation.

The location and design of the air supply registers and diffusers is of utmost importance in condensation prevention. Sliding glass doors and / or low windows on exterior walls must use a perimeter air distribution with supply air directed vertically along the glass surface. This configuration allows high air velocity and larger air volumes without causing drafts on the swimmers and pool surface.

IMPORTANT: All the registers should cover the entire width of the window. For windows mounted high on the walls, the supply air should be directed at all the glass surfaces from close range with all register throws less than twelve inches to the closest portion of the glass.

Air quantity and velocity must be large enough to blanket the entire glass surface with the warm dry supply air. Pool areas with a lot of high windows on the walls and / or skylights should have perimeter type air distribution located high up as well.

NOTE: Skylights are usually not recommended for indoor pool applications, as condensation is very difficult to control.

2.0. Air Distribution

Proper and adequate air distribution is very critical in a swimming pool environment. Undersized, restrictive ductwork with abrupt turns or transitions can decrease the efficiency and the moisture removal capacity of your dehumidifier.

2.1. Ducted Air Systems

Use ASHRAE, SMACNA low velocity duct construction standards. The dehumidifiers air volume (cfm) requirements are listed in this installation and operating manual.

Avoid all restrictions and short radius elbows that will have a tendency to increase the static pressure and cause air turbulence in the system.

2.1. Ducted Air Systems

Supply air from the dehumidifier should be directed away from the swimming pool and whirlpool surfaces and towards all exterior walls, especially any glass surfaces such as window areas, skylites, or patio doors. Grille sizing is also very important, check CFM rating.

A single central return air grille located on the wall as high as construction permits will be sufficient for most installations to prevent temperature stratification within the area.

Materials such as galvanized steel, aluminum, or PVC coated pipe are generally acceptable for duct installations. PVC or plastic coated galvanized spiral pipe is best suited for below grade ductwork installations. If ductwork is installed in an unconditioned space, be sure to insulate with a minimum of 2" fiberglass duct wrap with a vapor barrier facing. Due to the elevated humidity conditions in a pool or spa enclosure, avoid the use of fiberglass duct board or duct liners to prevent mold and bacteria growth.

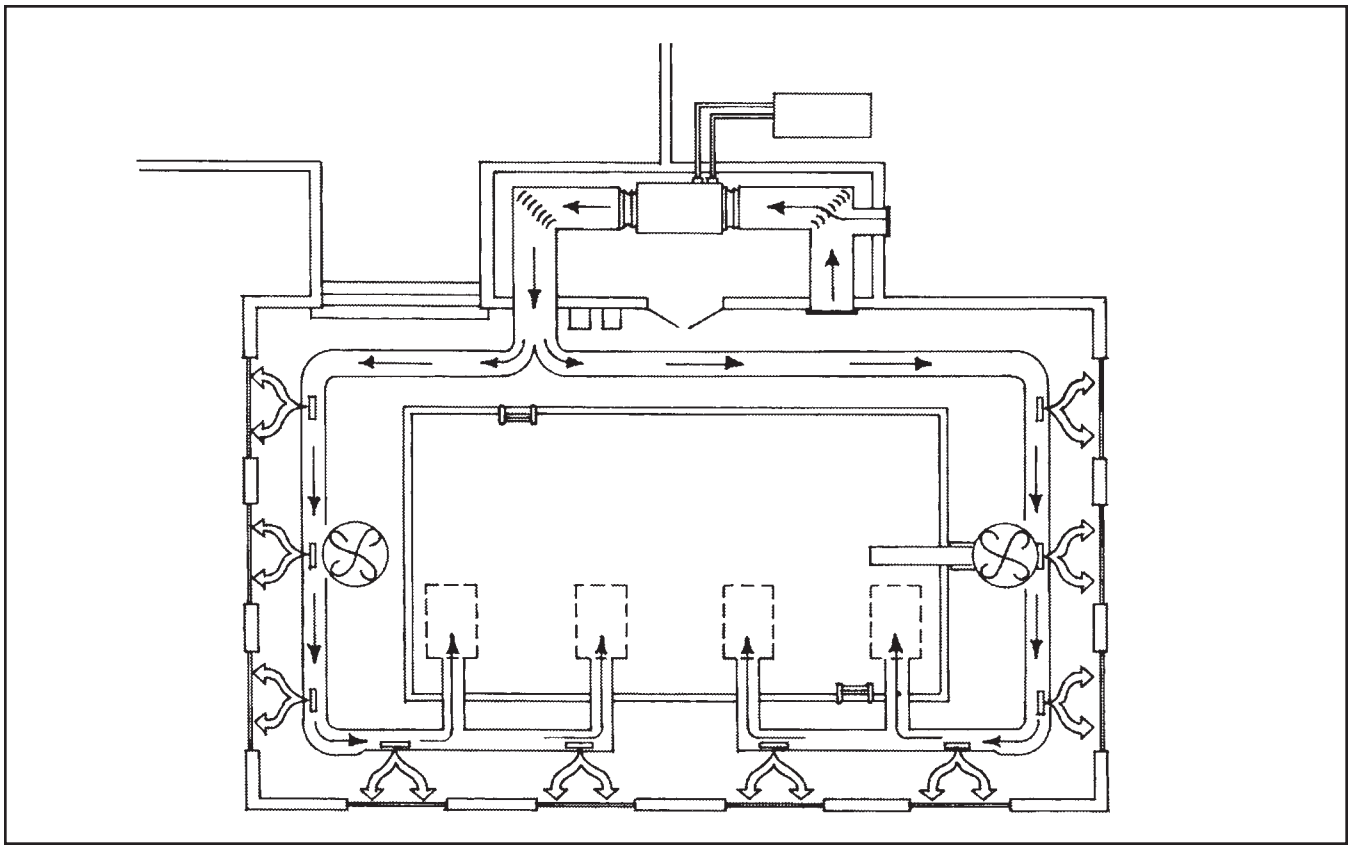


Figure 2.1.2. Duct Layout

2.1. Ducted Air Systems

If the ductwork is installed in an unconditioned area, then sufficient insulation should be used to prevent condensation and heat loss or heat gain. Neoprene flex duct connectors should be provided at the outlet and inlet duct collar connections of the DryAire dehumidifier to avoid any vibration noise on the system. The supply grilles, registers and diffusers should be selected on the basis of low static pressure loss NC (noise) levels, required throw distance and CFM requirements as well as an air pattern to cover the cold surface with warm dry air.

Avoid air movement across any water surface area. Even secondary pattern of air across any warm water surface will automatically increase the rate of evaporation of the pool water and will cause extended operating cycles. Do not allow supply air to short cycle back to the return air inlet.

NOTE: Inadequate duct system will cause poor operation and high utility cost.

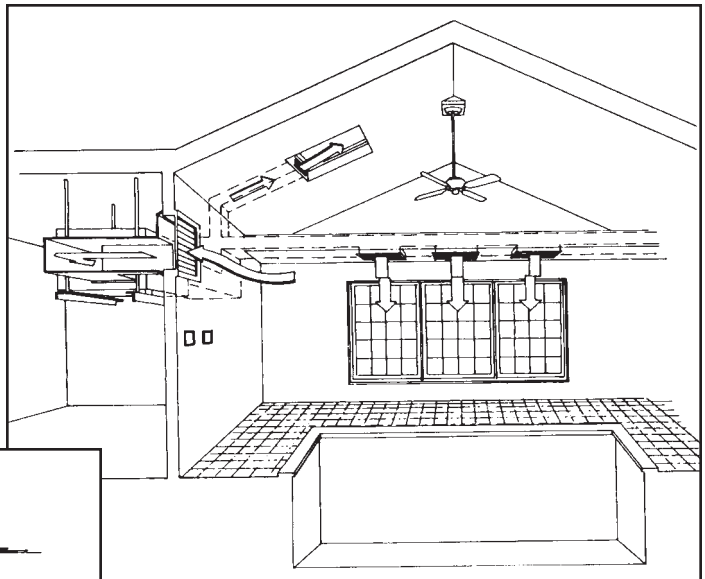


Figure 2.1.3. Duct Layout

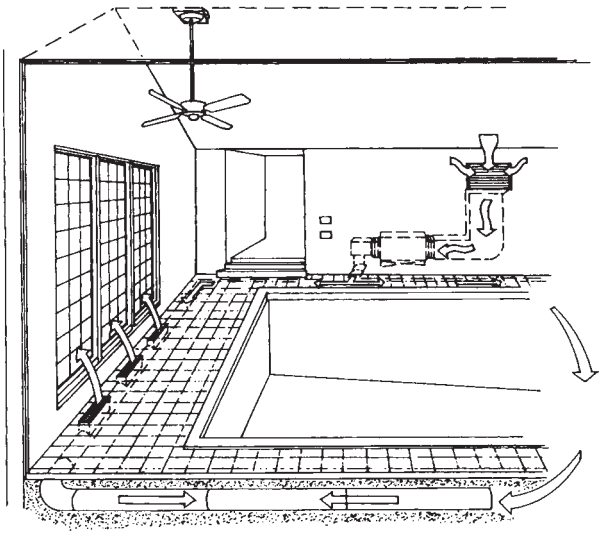


Figure 2.1.4. Below Grade Duct Layout

2.2. Prevent Air Stratification

To prevent air stagnation in high ceiling pool enclosures, or if skylites require additional air circulation a ceiling fan(s) is recommended. However, it should operate with an upward air flow. This will provide an upward movement of room air against the ceiling without affecting the evaporation of the pool water surface. Never install the ceiling fans directly above the pool water.

2.3. Non-Ducted (Free Blow) Installation

When installation of a ducted air system is not possible, care must be taken to direct all supply air toward exterior walls and windows. The dehumidifier should be located at a height, usually no more than ten (10) feet above the floor, to permit easy access. A minimum 36" long discharge duct must be equipped with horizontally adjustable, anodized alum. diffuser.

Be sure to allow adequate space for the return air to enter the back of the dehumidifier and adequate space, without any obstructions, for the supply air outlet of the dehumidifier. This will assure proper circulation of air for optimum performance.

2.4. Outdoor / Make-Up Air Applications

Codes for commercial buildings or new construction often require you to introduce outdoor air when the space is being occupied.

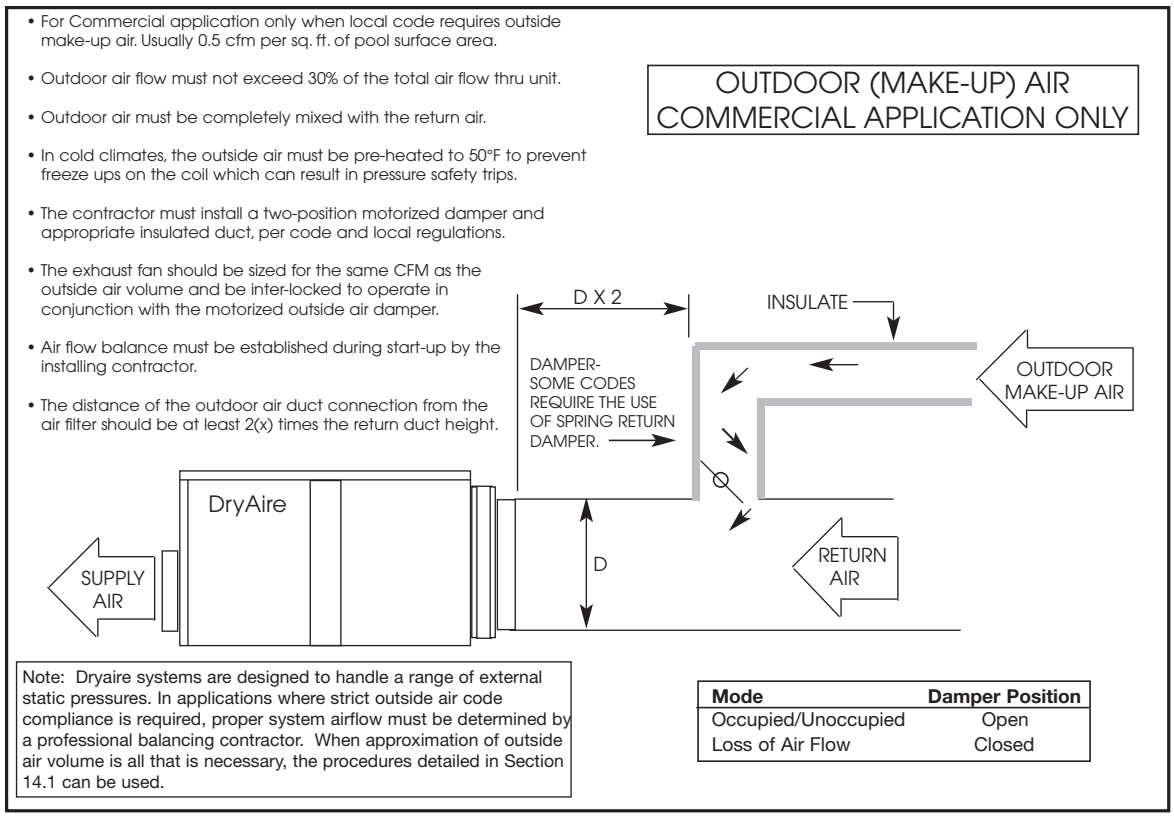

• For Commercial application only when local code requires outside make-up air. Usually 0.5 cfm per sq. ft. of pool surface area.
• Outdoor air flow must not exceed 30% of the total air flow thru unit.
• Outdoor air must be completely mixed with the return air.
• In cold climates, the outside air must be pre-heated to 50°F to prevent freeze ups on the coil which can result in pressure safety trips.
• The contractor must install a two-position motorized damper and appropriate insulated duct, per code and local regulations.
• The exhaust fan should be sized for the same CFM as the outside air volume and be inter-locked to operate in conjunction with the motorized outside air damper.
• Air flow balance must be established during start-up by the installing contractor.
• The distance of the outdoor air duct connection from the air filter should be at least 2(x) times the return duct height.
OUTDOOR (MAKE-UP) AIR
COMMERCIAL APPLICATION ONLY
D X 2
INSULATE
DAMPER-
SOME CODES
REQUIRE THE USE
OF SPRING RETURN
DAMPER.
OUTDOOR
MAKE-UP AIR
DryAire
D
SUPPLY
AIR
RETURN
AIR
Note: Dryaire systems are designed to handle a range of external static pressures. In applications where strict outside air code compliance is required, proper system airflow must be determined by a professional balancing contractor. When approximation of outside air volume is all that is necessary, the procedures detailed in Section 14.1 can be used.
Mode
Damper Position
Occupied/Unoccupied
Open
Loss of Air Flow
Closed

Figure 2.4.1. Outdoor Air Application

2.5. Auxiliary Heat (Duct Heater), If Required

In certain climates or regions and with some pool enclosures, construction materials, additional supplemental room heat is required, then an electric duct heater, duct furnace or hot water coil should be installed down stream in the supply air duct system of the DryAire dehumidifier.

When a duct heater (field supplied) is required to supply supplemental or auxiliary heat to satisfy the total heat loss of the pool area refer to equipment 24v wiring diagram attached to inside of electrical panel.

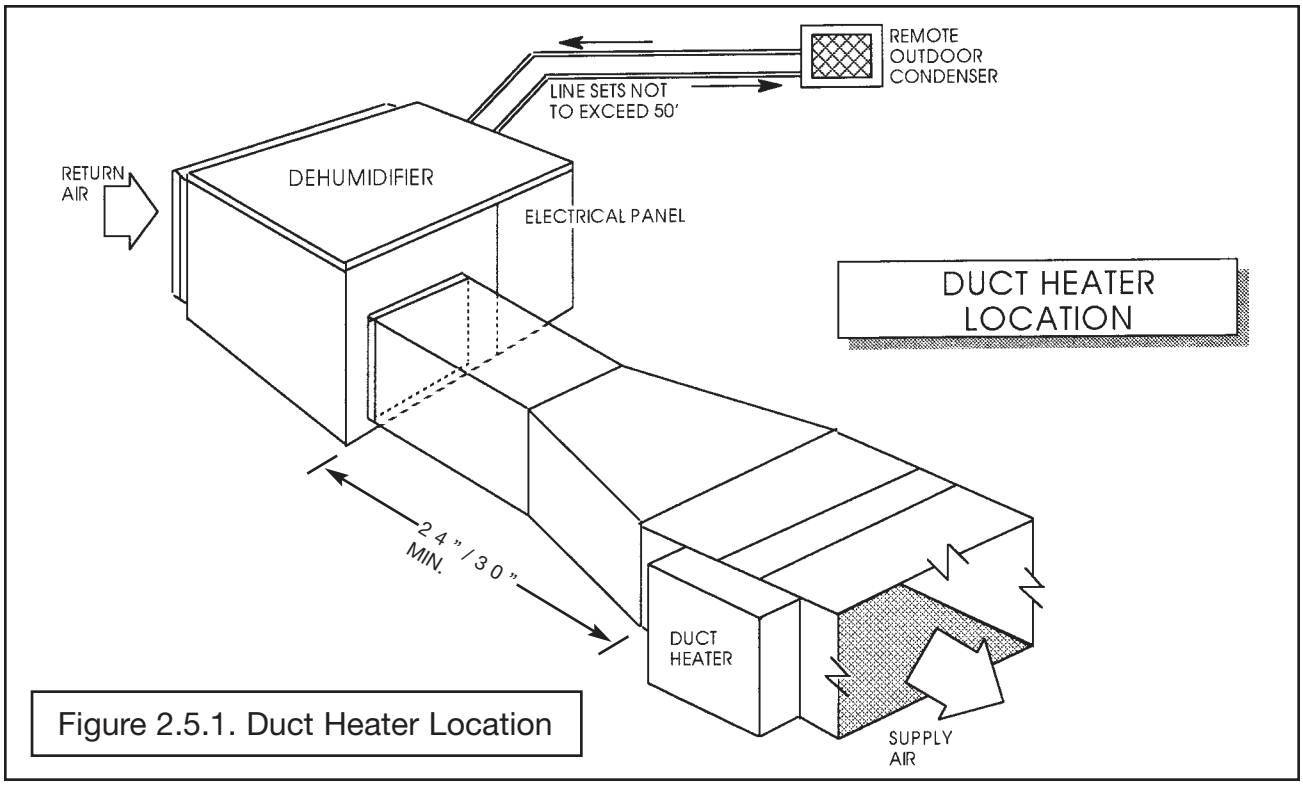


Figure 2.5.1. Duct Heater Location

2.6. Outdoor Installation

When the dehumidifier is located outdoors, or in an un-conditioned space where ambient temperatures can fall below 45°F, such as an attic, you must use an outdoor-rated dehumidifier (optional features) to included weatherproofing and thicker insulation. Special precautions must be taken with the condensate drain pan and piping to prevent winter freeze up.

Contractor must heat tape the condensate drain pan, P-trap and all exposed drain piping connections. Heat tape to have exterior power source from DryAire dehumidifier.

The blower indicator switch on the automatic thermostat must be set in the “ON” position which will allow the system blower to run continuously. This will circulate 80°F room air through the dehumidifier during the winter season.

3.0. Outdoor Remote Condenser

This outdoor remote condenser feature allows the dehumidifier to reject unwanted heat to the outdoors and as a result provide space cooling during the warm summer months.

An electronically operated solenoid valve diverts the flow of hot refrigerant to either the internal condenser, inside the dehumidifier for heating the air or sends the hot refrigerant to the outdoor remote condenser for air conditioning mode.

With outdoor temperature 32°F and below, the DryAire remote outdoor condenser will continue to operate efficiently. As an added feature on industrial and commercial models, the DryAire system has equipped the remote outdoor condenser with an exclusive head pressure control to operate at just the right pressure when low ambient temperatures exist.

3.1. Outdoor Remote Condenser Installation

The remote condenser shall be located outdoors and **MUST BE INSTALLED WITHIN 50 FT.** of the DryAire dehumidifier. Proper clearances must be allowed for service and maintenance as well as adequate air flow to and from the equipment. Provide a minimum 36" around the unit, do not allow objects or shrubs to obstruct the intake or discharge openings.

If the remote outdoor condenser is installed at ground level, a hard surface pad must be used and check to make sure the cabinet is level. A field supplied disconnect must be located within sight of remote condenser. Adequate and secure grounding must be provided in accordance to all local codes. Two (2) wire, 24 Volt low voltage wiring is required between the remote condenser and the dehumidifier.

3.1.1. Refrigerant Piping Remote Condenser

The outdoor remote condenser and dehumidifier have capped refrigerant pipe stubs for the line set connections. The remote condensers are shipped from the factory with a 30 psi holding charge of dry nitrogen and must be vented to prevent possible injury.

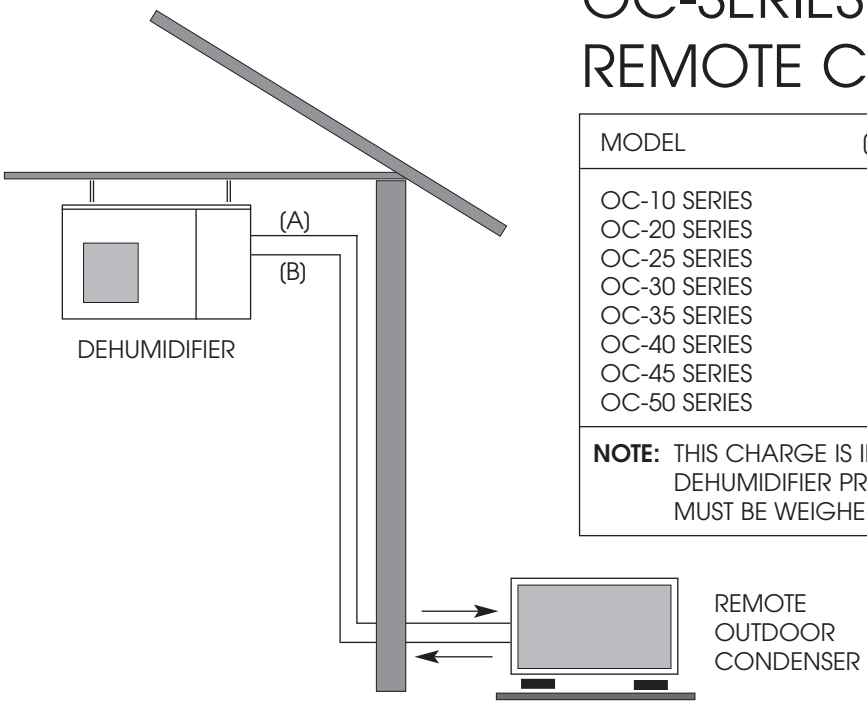
CAUTION: BEFORE REMOVING CAPS RELIEVE THE PRESSURE ON THE REMOTE OUTDOOR CONDENSER.

3.1.2. Refrigerant Piping Dehumidifier

The dehumidifiers are equipped with remote condenser service valves located in the blower compartment. The pipe stubs have been pressurized with refrigerant (R-22) for factory leak testing and must be vented to prevent possible injury.

CAUTION: BEFORE REMOVING CAPS ON THE DEHUMIDIFIER, MAKE SURE BALL VALVES ARE CLOSED.

OC-SERIES OUTDOOR REMOTE CONDENSERS



MODEL	(UP TO 25')	(26' TO 50')
OC-10 SERIES	12 LBS.	14 LBS.
OC-20 SERIES	15 LBS.	18 LBS.
OC-25 SERIES	23 LBS.	28 LBS.
OC-30 SERIES	23 LBS.	28 LBS
OC-35 SERIES	36 LBS.	40 LBS
OC-40 SERIES	36 LBS.	40 LBS.
OC-45 SERIES	37 LBS.	41 LBS.
OC-50 SERIES	51 LBS.	57 LBS.

NOTE: THIS CHARGE IS IN ADDITION TO THE DRYAIRE DEHUMIDIFIER PRE-CHARGED UNIT. CHARGE MUST BE WEIGHED INTO THE SYSTEM.

Table 1.

OUTDOOR CONDENSER	LINE SIZE REQUIRED (NOT TO EXCEED 50 FT.)							
	OC-10	OC-20	OC-25	OC-30	OC-35	OC-40	OC-45	OC-50
SUPPLY (A)	5/8" OD	5/8" OD	7/8" OD	7/8" OD	7/8" OD	7/8" OD	7/8" OD	1-1/8" OD
RETURN (B)	1/2" OD	1/2" OD	1/2" OD	1/2" OD	1/2" OD	5/8" OD	5/8" OD	7/8" OD

NOTE: ADDITIONAL REFRIGERANT CHARGE (R-22) REQUIRED FOR LINE SETS. (SEE CHART ABOVE)

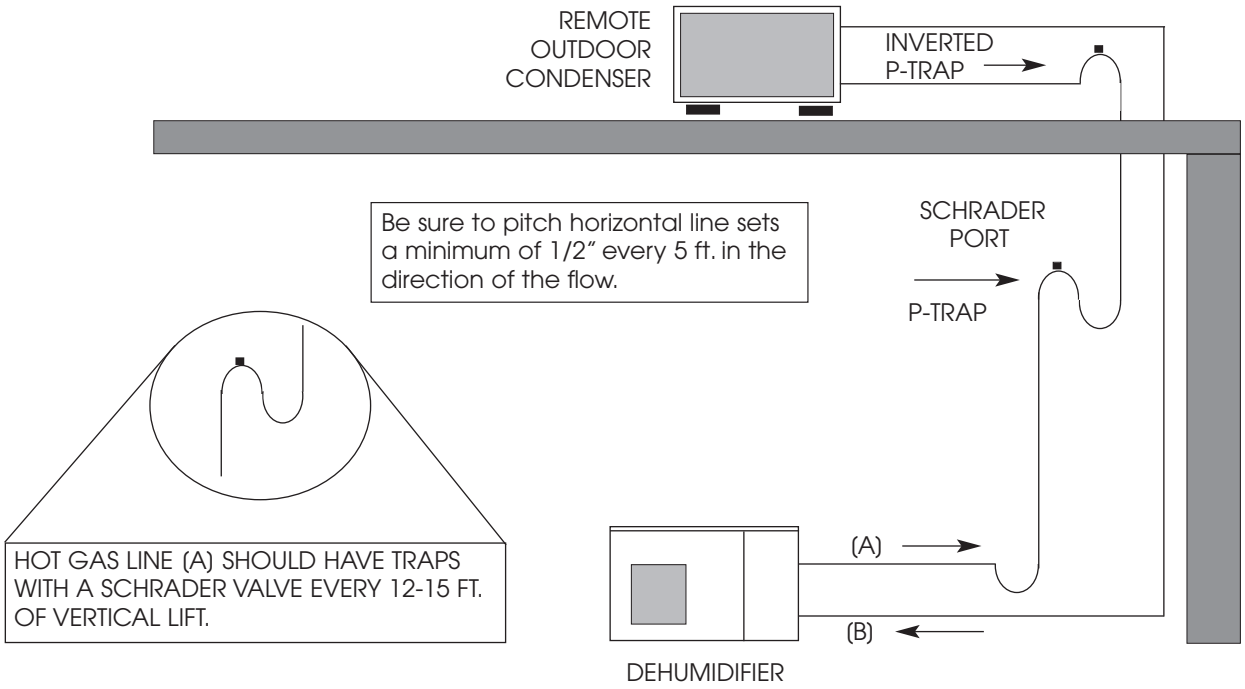


Figure 3.1.3. Outdoor Remote Condenser

3.1.4. Refrigerant Piping

Fabricate the proper size refrigerant piping (Refer to page 17) and use standard refrigerant piping practices.

When the outdoor remote condenser is installed above the dehumidifier, be sure to install traps in the hot gas (A) discharge line at approximately every 12-15 Ft. of vertical lift. (Refer to page 17) When you install a dehumidifier and remote condenser on the same level, be sure to pitch the horizontal line sets a minimum of 1/2" every 5 Ft. in the direction of the flow. Solder or braze the tubing joints with 45%, 15% or Stay-Brite® solder.

3.1.5. Refrigerant Piping Leak Check

After the refrigerant piping of the line sets is complete, check the lines for leaks by pressurizing the remote condenser and line set with dry nitrogen or refrigerant vapor. **Do not use refrigerant from dehumidifier for this purpose.**

Caution: Do not exceed 80 psig of nitrogen charge. Excessive nitrogen pressure can introduce non-condensables into the dehumidifier and contaminate the refrigerant system.

3.1.6. Evacuation of Line Sets and Remote Outdoor Condenser

Evacuate the condenser section and piping to 400 microns. Isolate the system for at least 10-15 minutes to verify the system is free from leaks, moisture and non-condensables.

3.1.7. Charging Outdoor Remote Condenser

When you install an outdoor remote condenser to the dehumidifier, you must add additional refrigerant to the system. Weigh in the exact amount of R-22 required (Refer to Page 17, Table 1 to determine the necessary charge for your application). To add the refrigerant, first heat up the cylinder, then charge liquid at the schrader valve on the remote condenser.

After you have added the proper amount of R-22 to the condenser and line sets, check for leaks, open the line set service valves located in the blower compartment of the Dryaire dehumidifier.

1. Balance of R-22, if needed, to be added as a vapor at the schrader valve port located in the electrical compartment on the dehumidifier. Make sure the thermostat is set in the cooling mode and the line set service valves located in the blower compartment are open. If dehumidifier goes off on high head pressure, make sure you have added the jumper wire in the thermostat sub-base between terminals R and RC. Refer to page 23 for Control Wire Diagram.

UNIT MODEL NO.	ELECTRICAL VOLTS	PHASE	MAX FUSE	MIN AMPACITY	R-22
DRY-10-208-1	208V	1	25 AMP	22.1 AMP	11#
DRY-10-230-1	230V	1	25 AMP	21.9 AMP	11#
DRY-10-208-3	208V	3	20 AMP	14.3 AMP	11#
DRY-10-230-3	230V	3	20 AMP	14.1 AMP	11#
DRY-10-460-3	460V	3	10 AMP	7.4 AMP	11#
DRY-20-208-1	208V	1	40 AMP	30.8 AMP	12#
DRY-20-230-1	230V	1	40 AMP	30.5 AMP	12#
DRY-20-208-3	208V	3	30 AMP	19.3 AMP	12#
DRY-20-230-3	230V	3	30 AMP	19.1 AMP	12#
DRY-20-460-3	460V	3	15 AMP	9.5 AMP	12#
DRY-25-208-1	208V	1	50 AMP	36.5 AMP	17#
DRY-25-230-1	230V	1	50 AMP	36.5 AMP	17#
DRY-25-208-3	208V	3	40 AMP	22.2 AMP	17#
DRY-25-230-3	230V	3	40 AMP	22.2 AMP	17#
DRY-25-460-3	460V	3	20 AMP	13.8 AMP	17#
DRY-30-208-1	208V	1	60 AMP	51.3 AMP	19#
DRY-30-230-1	230V	1	60 AMP	49.6 AMP	19#
DRY-30-208-3	208V	3	40 AMP	34.0 AMP	19#
DRY-30-230-3	230V	3	40 AMP	33.8 AMP	19#
DRY-30-460-3	460V	3	20 AMP	15.2 AMP	19#
DRY-40-208-3	208V	3	60 AMP	50.5 AMP	35#
DRY-40-230-3	230V	3	60 AMP	50.2 AMP	35#
DRY-40-460-3	460V	3	30 AMP	24.1 AMP	35#
DRY-50-208-3	208V	3	90 AMP	63.5 AMP	65#
DRY-50-230-3	230V	3	90 AMP	63.0 AMP	65#
DRY-50-460-3	460V	3	45 AMP	39.7 AMP	65#

UNIT MODEL NO.	ELECTRICAL VOLTS	PHASE	MAX FUSE
OC-10-208-1	208V	1	10 AMP
OC-10-230-1	230V	1	10 AMP
OC-20-208-1	208V	1	10 AMP
OC-20-230-1	230V	1	10 AMP
OC-25-208-1	208V	1	10 AMP
OC-25-230-1	230V	1	10 AMP
OC-25-208-3	208V	3	10 AMP
OC-25-230-3	230V	3	10 AMP
OC-25-460-3	460V	3	10 AMP
OC-30-208-1	208V	1	10 AMP
OC-30-230-1	230V	1	10 AMP
OC-30-208-3	208V	3	10 AMP
OC-30-230-3	230V	3	10 AMP
OC-30-460-3	460V	3	10 AMP
OC-35-230-1	230V	1	15 AMP
OC-35-208-3	208V	3	10 AMP
OC-35-230-3	230V	3	10 AMP
OC-35-460-3	460V	3	10 AMP
OC-40-230-1	230V	1	15 AMP
OC-40-208-3	208V	3	10 AMP
OC-40-230-3	230V	3	10 AMP
OC-40-460-3	460V	3	10 AMP
OC-45-230-1	230V	1	15 AMP
OC-45-230-1	208V	3	10 AMP
OC-45-230-1	230V	3	10 AMP
OC-45-230-1	460V	3	10 AMP
OC-50-208-3	208V	3	25 AMP
OC-50-230-3	230V	3	25 AMP
OC-50-460-3	460V	3	10 AMP

Minimum ampacity does not apply to OC models.
R-22 values for the OC models are found on page 20.

All specifications, descriptions, rating and products herein are subject to change without notice or recourse.

DRY-10 SERIES

	208/230V 1 PH	208/230V 3 PH	460V 3 PH
Compressor FLA	19.0	12.0	6.0
Compressor LRA	63	55	27
Unit System FLA	23.2	15.2	8.0
Max. Fuse Size	25	20	10
Min. Ampacity	22.1	14.3	7.4
Unit Full Load KW	2.8	3	2.9
Unit Operating KW	2.5	2.6	2.6

Width/Depth/Height.....34"/44"/21-1/2"
Refrigerant.....R-22/11#
Hot Gas Line.....5/8" Copper Sweat
Liquid Line.....1/2" Copper Sweat
Inlet Air (W x H).....22" x 18"
Filter Size.....20" x 25" x 1"
Outlet Air (W x H).....14" x 12"
Blower Motor.....1/3-HP
CFM.....900
Ext. Static Pressure.....0.50"
Heating Cap (btu/h).....17,200*
Condensate Drain.....3/4" FPT
Weight Lbs.....389

*Based on 82°F return air at 50% Rh

DRY-20 SERIES

	208/230V 1 PH	208/230V 3 PH	460V 3 PH
Compressor FLA	25.8	16	7
Compressor LRA	95	77	41
Unit System FLA	31.4	20.4	8
Max. Fuse Size	40	30	15
Min. Ampacity	30.8	19.3	10.5
Unit Full Load KW	4.4	4.3	4.3
Unit Operating KW	4	4	4

Width/Depth/Height.....34"/44"/21-1/2"
Refrigerant.....R-22/12#
Hot Gas Line.....5/8" Copper Sweat
Liquid Line.....1/2" Copper Sweat
Inlet Air (W x H).....22" x 18"
Filter Size.....20" x 25" x 1"
Outlet Air (W x H).....14" x 12"
Blower Motor.....1/2-HP
CFM.....1400
Ext. Static Pressure.....0.50"
Heating Cap (btu/h).....30,180 *
Condensate Drain.....3/4" FPT
Weight Lbs.....441

*Based on 82°F return air at 50% Rh

DRY-25 SERIES

	208/230V 1 PH	208/230V 3 PH	460V 3 PH
Compressor FLA	30	23	11
Compressor LRA	137	91	50
Unit System FLA	28.5	22.2	13.8
Max. Fuse Size	50	40	20
Min. Ampacity	28.4	24.2	13.7
Unit Full Load KW	5	5	5
Unit Operating KW	4.6	4.6	4.6

Width/Depth/Height.....45"/44"/22"
Refrigerant.....R-22/17#
Hot Gas Line.....7/8" Copper Sweat
Liquid Line.....1/2" Copper Sweat
Inlet Air (W x H).....36" x 17"
Filter Size.....(2) 20" x 20" x 2"
Outlet Air (W x H).....16" x 14"
Blower Motor.....3/4-HP
CFM.....1800
Ext. Static Pressure.....0.50"
Heating Cap (btu/h).....36,960 *
Condensate Drain.....3/4" FPT
Weight Lbs.....591

*Based on 82°F return air at 50% Rh

DRY-30 SERIES

	208/230V 1 PH	208/230V 3 PH	460V 3 PH
Compressor FLA	45	27	14
Compressor LRA	169	137	62
Unit System FLA	52.8	34.8	15.6
Max. Fuse Size	60	40	20
Min. Ampacity	51.3	34	15.2
Unit Full Load KW	7	7	7
Unit Operating KW	6	6	6

Width/Depth/Height.....45"/44"/22"
Refrigerant.....R-22/19#
Hot Gas Line.....7/8" Copper Sweat
Liquid Line.....1/2" Copper Sweat
Inlet Air (W x H).....36" x 17"
Filter Size.....(2) 20" x 20" x 2"
Outlet Air (W x H).....16" x 14"
Blower Motor.....1-HP
CFM.....2200
Ext. Static Pressure.....0.50"
Heating Cap (btu/h).....45,160 *
Condensate Drain.....3/4" FPT
Weight Lbs.....591

*Based on 82°F return air at 50% Rh

DRY-40 SERIES

	208/230V 1 PH	208/230V 3 PH	460V 3 PH
Compressor FLA	N/A	45	23
Compressor LRA	N/A	195	95
Unit System FLA	N/A	52	25.8
Max. Fuse Size	N/A	60	30
Min. Ampacity	N/A	50.5	24.1
Unit Full Load KW	N/A	11	11
Unit Operating KW	N/A	10	10

Width/Depth/Height.....48"/55"/29-1/2"
Refrigerant.....R-22/35#
Hot Gas Line.....7/8" Copper Sweat
Liquid Line.....1/2" Copper Sweat
Inlet Air (W x H).....36" x 24"
Filter Size.....(2) 20" x 25" x 2"
Outlet Air (W x H).....20" x 18"
Blower Motor.....1-1/2-HP
CFM.....3200
Ext. Static Pressure.....0.50"
Heating Cap (btu/h).....69,120 *
Condensate Drain.....3/4" FPT
Weight Lbs.....862

*Based on 82°F return air at 50% Rh

DRY-50 SERIES

	208/230V 1 PH	208/230V 3 PH	460V 3 PH
Compressor FLA	N/A	42	27.6
Compressor LRA	N/A	267	135
Unit System FLA	N/A	51	32
Max. Fuse Size	N/A	90	45
Min. Ampacity	N/A	63.7	41.1
Unit Full Load KW	N/A	18.48	18.48
Unit Operating KW	N/A	15.93	15.93

Width/Depth/Height.....64"/50"/43"
Refrigerant.....R-22/65#
Hot Gas Line.....1-1/8" Copper Sweat
Liquid Line.....7/8" Copper Sweat
Inlet Air (W x H).....37" x 33"
Filter Size.....(4) 18" x 20" x 2"
Outlet Air (W x H).....19-1/2 x 17-1/2"
Blower Motor.....3-HP
CFM.....5200
Ext. Static Pressure.....0.50"
Heating Cap (btu/h).....108,200 *
Condensate Drain.....1" FPT
Weight Lbs.....1140

*Based on 82°F return air at 50% Rh

DRY-10-V SERIES

	208/230V 1 PH	208/230V 3 PH	460V 3 PH
Compressor FLA	13.4	8.7	4.2
Compressor LRA	59	50	23
Unit System FLA	17	12	5.7
Max. Fuse Size	25	20	10
Min. Ampacity	20.7	16.3	7
Unit Full Load KW	2.8	3	2.9
Unit Operating KW	2.5	2.5	2.5

Width/Depth/Height.....36"/24"/64"
Refrigerant.....R-22/12#
Hot Gas Line.....5/8" Copper Sweat
Liquid Line.....1/2" Copper Sweat
Inlet Air (W x H).....22" x 13"
Filter Size.....20" x 25" x 1"
Outlet Air (W x H).....14" x 12"
Blower Motor.....1/3-HP
CFM.....900
Ext. Static Pressure.....0.50"
Heating Cap (btu/h).....17,500 *
Condensate Drain.....3/4"FPT
Weight Lbs.....387

*Based on 82°F return air at 50% Rh

DRY-20-V SERIES

	208/230V 1 PH	208/230V 3 PH	460V 3 PH
Compressor FLA	23	14	7
Compressor LRA	93	74	41
Unit System FLA	27	17	8
Max. Fuse Size	40	30	15
Min. Ampacity	34.2	23	10
Unit Full Load KW	4.4	4.3	4.3
Unit Operating KW	4	4	4

Width/Depth/Height.....36"/24"/64"
Refrigerant.....R-22/14#
Hot Gas Line.....5/8" Copper Sweat
Liquid Line.....1/2" Copper Sweat
Inlet Air (W x H).....22" x 18"
Filter Size.....20" x 25" x 1"
Outlet Air (W x H).....14" x 12"
Blower Motor.....1/2-HP
CFM.....1400
Ext. Static Pressure.....0.50"
Heating Cap (btu/h).....30,180 *
Condensate Drain.....3/4"FPT
Weight Lbs.....427

*Based on 82°F return air at 50% Rh

DRY-30-V SERIES

	208/230V 1 PH	208/230V 3 PH	460V 3 PH
Compressor FLA	34	21	9
Compressor LRA	142	130	65
Unit System FLA	40	24	11
Max. Fuse Size	60	40	20
Min. Ampacity	51.3	35.1	13.2
Unit Full Load KW	7	7	7
Unit Operating KW	6	6	6

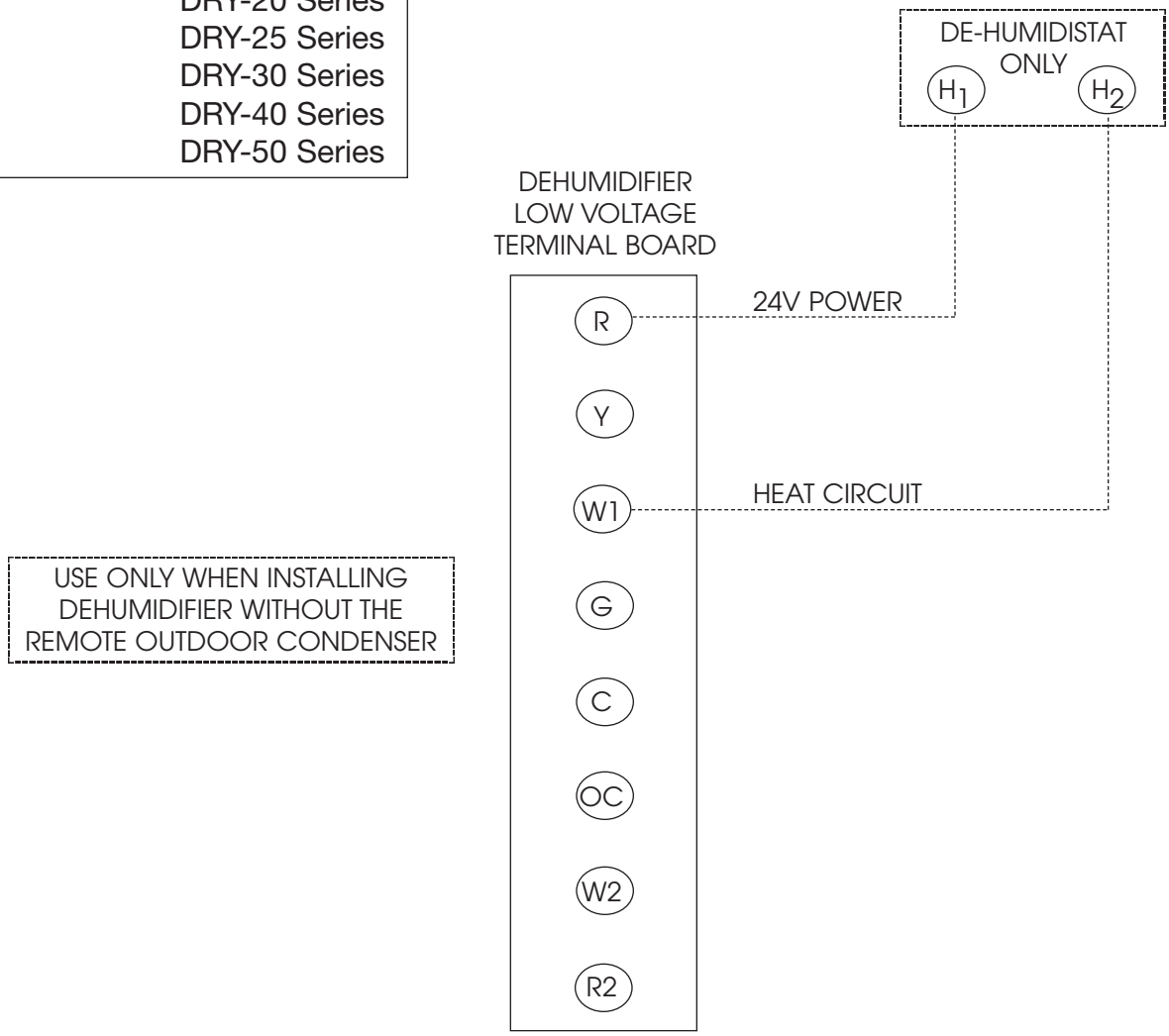
Width/Depth/Height.....47"/29"/70"
Refrigerant.....R-22/22#
Hot Gas Line.....7/8" Copper Sweat
Liquid Line.....1/2" Copper Sweat
Inlet Air (W x H).....36" x 17"
Filter Size.....(2) 20" x 20" x 2"
Outlet Air (W x H).....16" x 14"
Blower Motor.....1-HP
CFM.....2200
Ext. Static Pressure.....0.50"
Heating Cap (btu/h).....45,160 *
Condensate Drain.....3/4"FPT
Weight Lbs.....487

*Based on 82°F return air at 50% Rh

CONTROL WIRING DIAGRAM #1

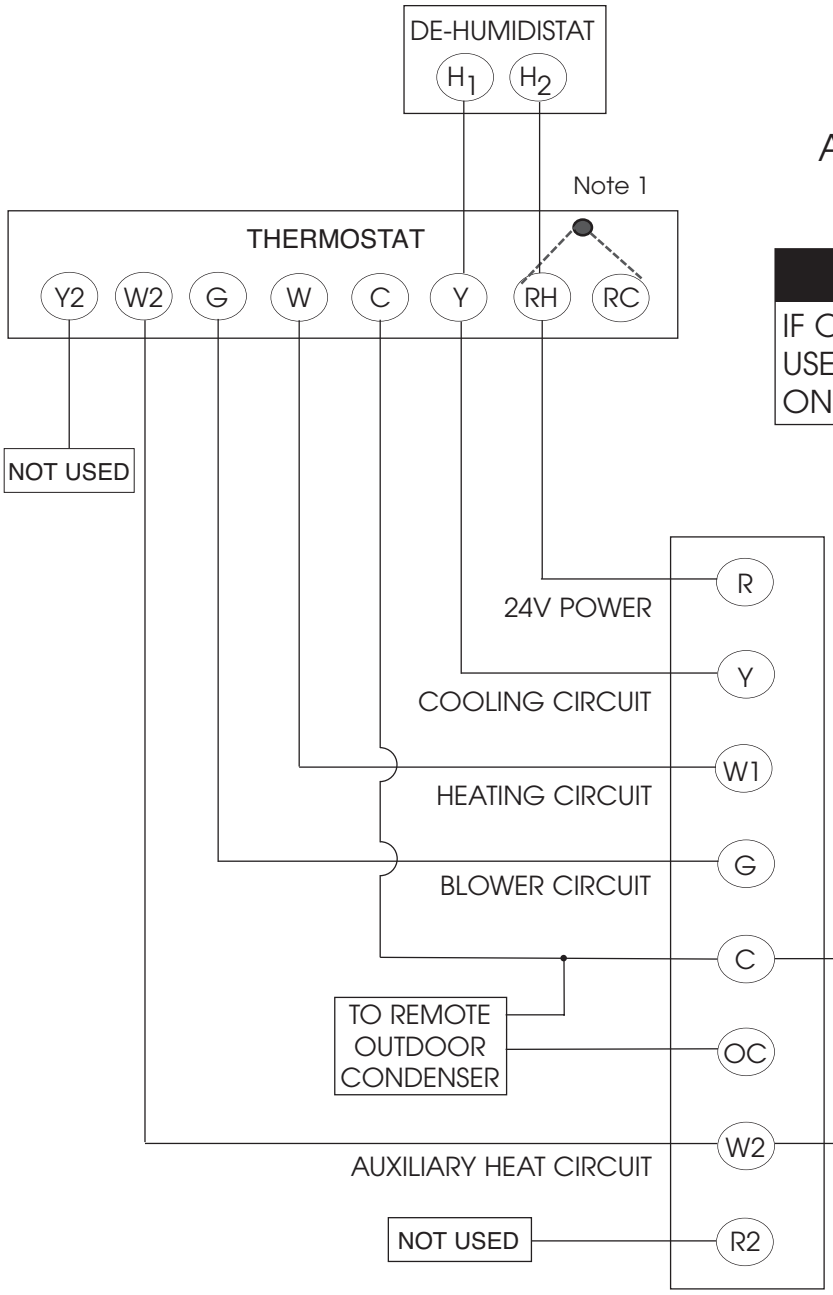
DH-46 DE-HUMIDISTAT

For Models: DRY-10 Series
DRY-20 Series
DRY-25 Series
DRY-30 Series
DRY-40 Series
DRY-50 Series



Added R2 Terminal	01/21/91	JMF
Revisions	Date	By
DryAire Systems		
Drn: MSU	Ck'd: MSU	Ap'vd: DWS
Date: 09/12/90	Scale: Full	
24 VAC Control Wiring		

OPTIONAL CONTROL WIRING DIAGRAM



DH-46 DE-HUMIDISTAT
ME-52 MICRO ELECTRONIC
AUTO/MULTI-STAGE THERMOSTAT

IMPORTANT

IF OUTDOOR CONDENSER IS INSTALLED USE JUMPER WIRE BETWEEN R_H & R_C ON THERMOSTAT.

For Models:

DRY-10 / OC-10
DRY-20 / OC-20
DRY-25 / OC-25
DRY-30 / OC-30
DRY-30 / OC-35
DRY-40 / OC-40
DRY-40 / OC-45
DRY-50 / OC-50

Note #1 IF OUTDOOR CONDENSER IS INSTALLED USE JUMPER WIRE BETWEEN R_H & R_C

Added R2Terminal	01/21/97	JMF
Revisions	Date	By
DryAire Systems		
Drn: MSU	Ck'd: MSU	Ap'vd: DWS
Date: 09/12/90	Scale: Full	
24 VAC Control Wiring		

IMPORTANT

Directions for Correct T-stat Installer Set-Up Option.

Function	Set
1 > > > > > >	7
3 > > > > > >	1
5 > > > > > >	2
6 > > > > > >	9
9 > > > > > >	2
12 > > > > > >	1
14 > > > > > >	0
15 > > > > > >	0
27 > > > > > >	87
28 > > > > > >	75

4.0. Head Pressure Controller / Remote Condenser

The capacity of an air cooled condenser will vary with the difference between the entering air dry bulb temperature and the condensing temperature of the refrigerant. The low ambient control will insure the condensing temperature is sufficiently high enough for proper operation of the refrigerant expansion valve during low ambient conditions.

4.1. Low Ambient Head Pressure Control

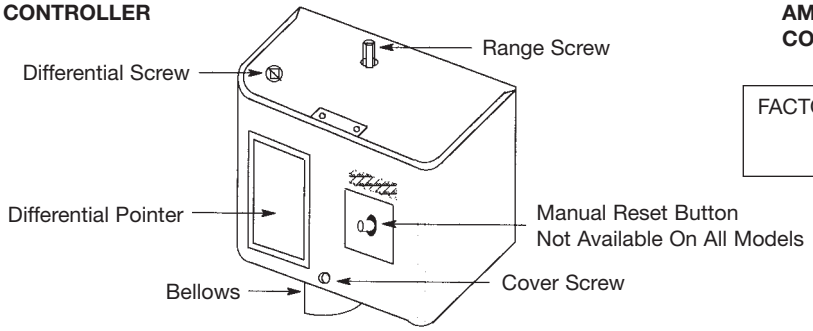
With outdoor temperature 32°F and below, the DryAire remote outdoor condenser will continue to operate efficiently. As an added feature on industrial and commercial models, the DryAire system has equipped the remote outdoor condenser with an automatic head pressure controller to operate at just the right pressure when low ambient temperatures exist.

This remote outdoor condenser head pressure control is provided to vary the air flow through the condenser using a fan cycling method during low ambient conditions.

This low ambient control is factory installed and pre-set. In most cases, field adjustment should not be required.

Settings: “On” @ 150 psi / “Off” @ 100 psi

OUTDOOR REMOTE CONDENSER LOW AMBIENT CONTROLLER



IMPORTANT: DO NOT FIELD ADJUST LOW AMBIENT CONTROLLER. CONTACT FACTORY

FACTORY SET: “ON” @ 150 PSI
“OFF” @ 100 PSI
DIFFERENTIAL 50 PSI

5.0. System Air Flow

Proper unit air flow is critical to the overall performance of dehumidification systems. Be sure to check the static pressure requirements and design limitations of both pieces of equipment for proper installation and operation.

All DryAire Series dehumidifiers are shipped from the factory with the external static pressure adjusted at a range of 0.10" to 1.0" w/c. A different motor pulley, flywheel or motor of another horsepower rating may be required to achieve 1.0" ESP or desired external static pressure.

5.1. Excessive Air Flow Problems.

1. High amp draw on blower motor.
2. Decrease in moisture removal capacity.
3. Excessive unit noise.
4. Water Carry-over from evaporator coil.

5.2. Inadequate Air Flow Problems

1. Can cause excessive discharge (high side) refrigeration pressure.
2. Could lead to premature compressor failure.
3. Increase of energy consumption.

5.3. Drive Information

Table 3

		MOTOR HP (ESP)		RPM (ESP)		MOTOR PULLEY	
MODEL NO.	CFM	0.5"	1.0"	0.5"	1.0"	0.5"	1.0"
DRY-10 SERIES	900	1/3	1/3	555	980	VL34	VL44
DRY-20 SERIES	1400	1/2	1/2	759	1060	VL34	VL44
DRY-30 SERIES	2200	1	1	624	920	VL44	VL44
DRY-40 SERIES	3200	1-1/2	1-1/2	630	710	VL44	VL44
DRY-50 SERIES	5200	3	3	959	1070	1VP-50-7/8	

All DryAire dehumidifiers are shipped from the factory with the external static pressure set at 0.50" ESP. Units can be special ordered adjusted to 1.0" ESP direct from the factory or field adjusted as above.

5.4. Pulley Adjustment

If ESP readings indicate low air flow, loosen set screw on the variable pitch motor pulley and turn outer face clockwise. On higher than required air flow, then turn the outer pulley face counter-clockwise.

IMPORTANT: Be sure to re-tighten the set screw on the flat spot of the pulley hub.

If you have any questions concerning blower speed, cfm, or static pressure field adjustment, contact factory.

6.0. Start-Up Procedure

A complete start-up will minimize problems and expensive callbacks. The start-up will be quicker and easier if the space to be dehumidified is at its design temperature and humidity condition. You may need to use portable heaters to heat the room. Read this section thoroughly before attempting to start-up the DryAire dehumidifier.

6.1. Prior to Start-Up

IMPORTANT: THE MAIN POWER TO THE UNIT CRANKCASE HEATER MUST BE ON FOR A MINIMUM OF 24 HOURS BEFORE UNIT IS OPERATED.

1. LEAK TEST ALL FIELD AND FACTORY PIPING.

2. Check the rating plate for power requirements. The available power supply voltage must be within + 10% of the voltage printed on the rating plate.

3. Verify that all field wiring matches the DryAire wiring schematics and inspect and tighten all field and factory wiring.

4. Check and adjust the belt tension for 1" deflection at the mid-point of the blower belt(s). Check and make sure set screws on pulleys are tight and secure.

5. Check the drain pan and the condensate piping by pouring water into the drain pan to prime the P-trap assembly. Inspect for leaks.

6. If you installed a supplemental or auxiliary air heater, make sure it is installed in the air discharge (supply) duct and not the return duct.

7. If you installed an outdoor remote condenser verify that all service valves in the dehumidifier refrigerant lines are fully open and the jumper wire has been added to the thermostat sub-base as indicated on the control wire diagram.

8. Inspect the air filters and coils for dirt or construction debris. If necessary, clean the coils and install new air filters.

9. Make sure that neoprene vibration isolator pads are placed under the dehumidifier at each corner and unit is level.

7.0. Operational Sequence

The standard operating modes for a DryAire dehumidifier with a remote outdoor condenser is very simple. When ever the compressor is running, R-22 refrigerant flows through the evaporator coil and absorbs heat from the warm, humid return air. This heat must be rejected to either the swimming pool room or the remote outdoor condenser. The dehumidifier will direct the heat where it is needed (or not needed) as determined by the control set-points.

Whenever a remote outdoor condenser is not used in the system, the dehumidifier will always reject the heat to the swimming pool room. In warmer months, if room temperature exceeds 95°F to 100°F, the safety high pressure switch will shut the compressor down to protect the compressor. Should the safety switch continue to trip out from high head pressure, you may want to add the optional remote outdoor condenser previously offered.

REFRIGERATION FLOW DIAGRAM

FIG. -1

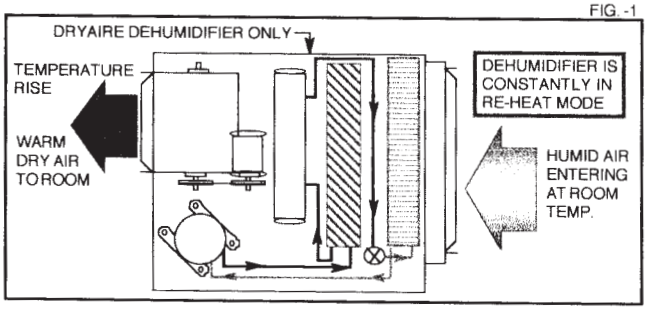

DRYAIRE DEHUMIDIFIER ONLY
TEMPERATURE RISE
WARM DRY AIR TO ROOM
DEHUMIDIFIER IS CONSTANTLY IN RE-HEAT MODE
HUMID AIR ENTERING AT ROOM TEMP.

FIG. -2

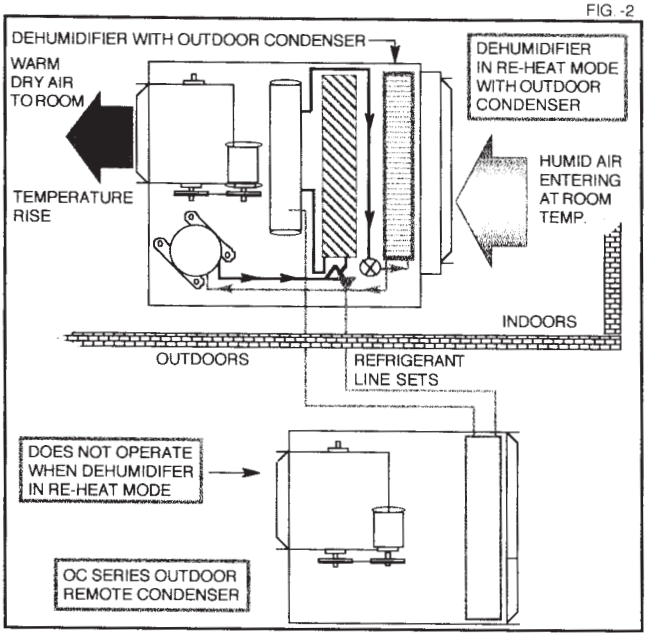
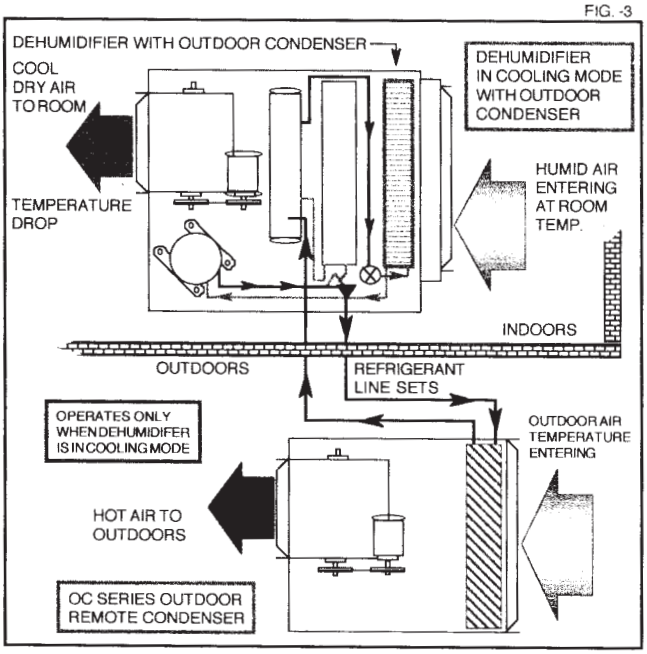

DEHUMIDIFIER WITH OUTDOOR CONDENSER
WARM DRY AIR TO ROOM
DEHUMIDIFIER IN RE-HEAT MODE WITH OUTDOOR CONDENSER
HUMID AIR ENTERING AT ROOM TEMP.
TEMPERATURE RISE
INDOORS
OUTDOORS
REFRIGERANT LINE SETS
DOES NOT OPERATE WHEN DEHUMIDIFER IN RE-HEAT MODE
OC SERIES OUTDOOR REMOTE CONDENSER

FIG. -3


DEHUMIDIFIER WITH OUTDOOR CONDENSER
COOL DRY AIR TO ROOM
DEHUMIDIFIER IN COOLING MODE WITH OUTDOOR CONDENSER
HUMID AIR ENTERING AT ROOM TEMP.
TEMPERATURE DROP
INDOORS
OUTDOORS
REFRIGERANT LINE SETS
OPERATES ONLY WHEN DEHUMIDIFER IS IN COOLING MODE
OUTDOOR AIR TEMPERATURE ENTERING
HOT AIR TO OUTDOORS
OC SERIES OUTDOOR REMOTE CONDENSER

DEHUMIDIFIER ONLY [Fig. 1]

The DryAire dehumidifier installed by itself will always discharge warm dry air back to the room. The discharge air temperature will be approximately 10°F to 20°F above the inlet air temperature. The moisture content of the air will also contribute to the temperature rise.

If the discharge of warm supply air becomes a concern, especially during summer months, we recommend an optional Remote Outdoor Condenser that properly matches the system.

REMOTE OUTDOOR AIR-COOLED CONDENSER [Fig. 2-3]

The addition of a DryAire remote outdoor condenser will transform the dehumidifier into an air conditioner and allow cool dry air to discharge back into the room. The cool dry discharge air temp will be approximately 10°F to 20°F below the inlet air temperature. This function is controlled by an automatic change over thermostat.

SYSTEM DESIGN

When the DryAire de-humidistat control calls for dehumidification, the thermostat monitors the room temperature; if the temperature is above the setpoint, the changeover thermostat will automatically switch to cooling mode.

An electronically operated solenoid valve will divert the flow of refrigerant from the internal condenser in the dehumidifier to the outdoor remote condenser, allowing the dehumidifier to discharge cool dry air into the room.

When the thermostat is satisfied and the room temperature falls below the heating setpoint, the thermostat will automatically call for heat and the solenoid valve will divert the refrigerant back to the internal condenser located in the dehumidifier and discharge warm dry air.

7.1. System Modes of Operation

7.1.1. Dehumidification / Air Reheat Mode

When the room air requires dehumidification and heating, the dehumidifier runs in the “reheat” mode. The hot refrigerant is discharged into the reheat condenser, which warms the dry air. The air that is discharged as supply air from the unit is drier and approximately 15°F to 20°F warmer than the entering return air.

7.1.2. Dehumidification / Air Cooling Mode

When the room air requires cooling or dehumidification and cooling, the dehumidifier will run in the air cooling mode. The hot refrigerant must be discharged to a remote condenser other than the reheat coil. The hot refrigerant can be discharged to an outdoor remote condenser, if so equipped. The air that is discharged as supply air from the dehumidifier is drier and approximately 20°F cooler than the entering return air.

7.1.3. Blower Operation

When the fan on the automatic change-over thermostat is set in the “auto” position, the blower motor will start on a call for dehumidification, heating or cooling, (outdoor remote condenser required for cooling mode). As the controls become satisfied, the blower motor will shut off.

When the fan on the automatic change-over thermostat is set in the “on” position, the blower motor will run continuously. This helps prevent air stagnation and stratification.

Note: If duct sensors are used to read the temperature and humidity levels, then the blower must also operate continuously to provide proper air movement over the duct sensors.

7.2. Power On !

7.2.1. Set the de-humidistat control below the room condition, the dehumidifier should start and operate normally. If dehumidifier does not start, check the electrical connections.

7.2.2. Measure the outlet air and the inlet air temperatures. The air leaving the dehumidifier should be approximately 15°F to 20°F (plus or minus 2°F) warmer than the entering air temperature.

NOTE: When a dehumidifier is installed with a remote outdoor condenser the air temperature leaving the dehumidifier should be approximately 15°F to 20°F (plus or minus 2°F) cooler than the entering air temperature.

Thermostat Set-Points

7.2.3. The Honeywell® automatic change-over t-stat has a minimum 3°F dead band. Setpoint require 2°F for heat and 2°F for cool. For a desired temperature of 82°F room, set heat at 80°F and cool lever at 84°F.

7.2.4. At this time, the blower should be checked for correct rotation and the adjustable motor pulley set for the proper air delivery. Make proper adjustments to the pulley and / or the motor mounting bracket if necessary for design air quantity.

7.2.5. Check the refrigerant pressures, the head pressure should be 180 / 275 psi suction pressure should be 50 / 65 psi, depending on current load conditions.

8.0. Start-Up Report Procedure

8.1. The start-up report is located in the installation and operational manual envelope that came with the equipment. An additional copy for your review is also located in this manual. Read and fill out the report completely. Upon receipt of this report, DryAire will verify the integrity of the installation. A thorough start-up can reduce callbacks and help increase customer satisfaction. Be sure to keep a copy for future reference. If the start-up report is misplaced, call DryAire Systems for a new copy.

THE START-UP REPORT IS REQUIRED FOR WARRANTY VALIDATION AND REGISTRATION #.

8.1.1. Record the return air temperature and suction line pressure, condenser and supply air discharge on start-up report provided.

8.1.2. At this time check the actual amp rating of the equipment.

8.1.3. Return the de-humidistat to the normal setting, usually its between 50% and 60% relative humidity.

9.0. Maintenance Procedure

Only minimal maintenance is required of the DryAire dehumidifier. The compressor and refrigeration circuit is a sealed system and repairs must only be made by qualified service technicians.

9.1. Monthly Inspection

1. Air filters should be inspected and replaced if necessary.

2. Check the air flow around the outdoor remote condenser to make sure the intake and discharge grilles are obstruction free form leaves or snow build-up.

9.2. Six Month Inspection

WITH POWER SUPPLY OFF!

1. Check the blower belts in the dehumidifier and the optional remote outdoor condenser for excessive wear, cracks and proper tension. Approximately 1" deflection at their midpoint.

2. Check and tighten, if needed, all electrical connections.

3. Inspect the condensate drain pan and clean if necessary.

4. Check both refrigerant pressures and amp draw on motors and compressor. Compare the readings with the original copy of the start-up report.

10.0. Trouble Shooting Section

10.1. Unit Will Not Operate

De-humidistat set too high.	Lower de-humidistat setting until unit comes on.
Thermostat switch set in off mode.	Set thermostat to automatic mode.
No main power.	Re-set circuit breaker.
Controls stuck in open position.	Repair or replace control.

10.2. Condensation on Walls

De-humidistat turned off.	Turn de-humidistat on to desired setting.
Air and pool water temperature imbalance.	Air temperature should be 2°F above the water temperature. Recommended at 82°F air temp. and 80°F water temp. for best efficiency.
Air stratification.	Consider continuous blower operation.
Blower running to fast.	Adjust blower speed.
Location of sensor controls.	Change location of controls.
Ductwork design.	Refer to catalog data sheets.
Poor air distribution.	Evaluate duct design and dehumidifier location.

10.3. Evaporator Coil Freeze Up

Entering air temperature too low.	Raise entering air temperature.
Insufficient evaporator air flow.	Check system air flow, dirty filters/coils or restricted ductwork.
Lack of refrigerant.	Check suction pressure and evaluate unit charge.
Restriction in filter dryer.	Check pressure drop and replace if necessary.
Restriction in refrigerant piping.	Evaluate debris in distributor.
Defective expansion valve.	Check expansion valve performance and replace if necessary.
Faulty or improperly set hot-gas bypass valve.	Open hot-gas isolation valve, if equipped. Set hot gas valve to maintain 32°F suction temperature (58 psig), or replace if necessary.

10.4. Head Pressure Too High / In Cooling Mode

The outdoor remote condenser can cause high head pressures.

Lack of air flow.	Check remote outdoor condenser coil for debris.
Remote condenser blower motor	
A. Overload tripped out.	Reduce blower speed and reset overload.
B. Blower cycling on internal protection.	Reduce blower speed.
C. Contactor faulty.	Replace contactor.
D. Jumper wire missing on sub-base.	Add jumper wire, refer to wire diagram.
Service valves not fully open.	Fully open service valves.
Excessive pressure drop in line sets.	Re-evaluate remote condenser installation section.

Note: When the outdoor remote condenser is active and the outdoor temperature is 95°F, the normal head pressure can be as high as 300 psig.

11.0. Service Diagnosis Chart

11.1. Dehumidifier Runs

DEHUMIDIFIER RUNS

LOW HEAD HIGH SUCTION

- Defective valve(s) in compressor.

HIGH HEAD PRESSURE

- Loose belt or pulley.
- Not enough air.
- Air short cycling.
- Dirty coil.
- Air in system.
- Refrigerant over charged.
- Ball valve closed.
- Return air temperature above 90°F.

LOW SUCTION PRESSURE

- Low on refrigerant.
- Not enough air.
- Restricted distribution.
- Dryer restricted.
- Bad TXV valve.
- Power element.

DEHUMIDIFIER OFF {CONTACTOR OPEN}

HOLDING COIL IS POWERED

- Burned out holding coil.

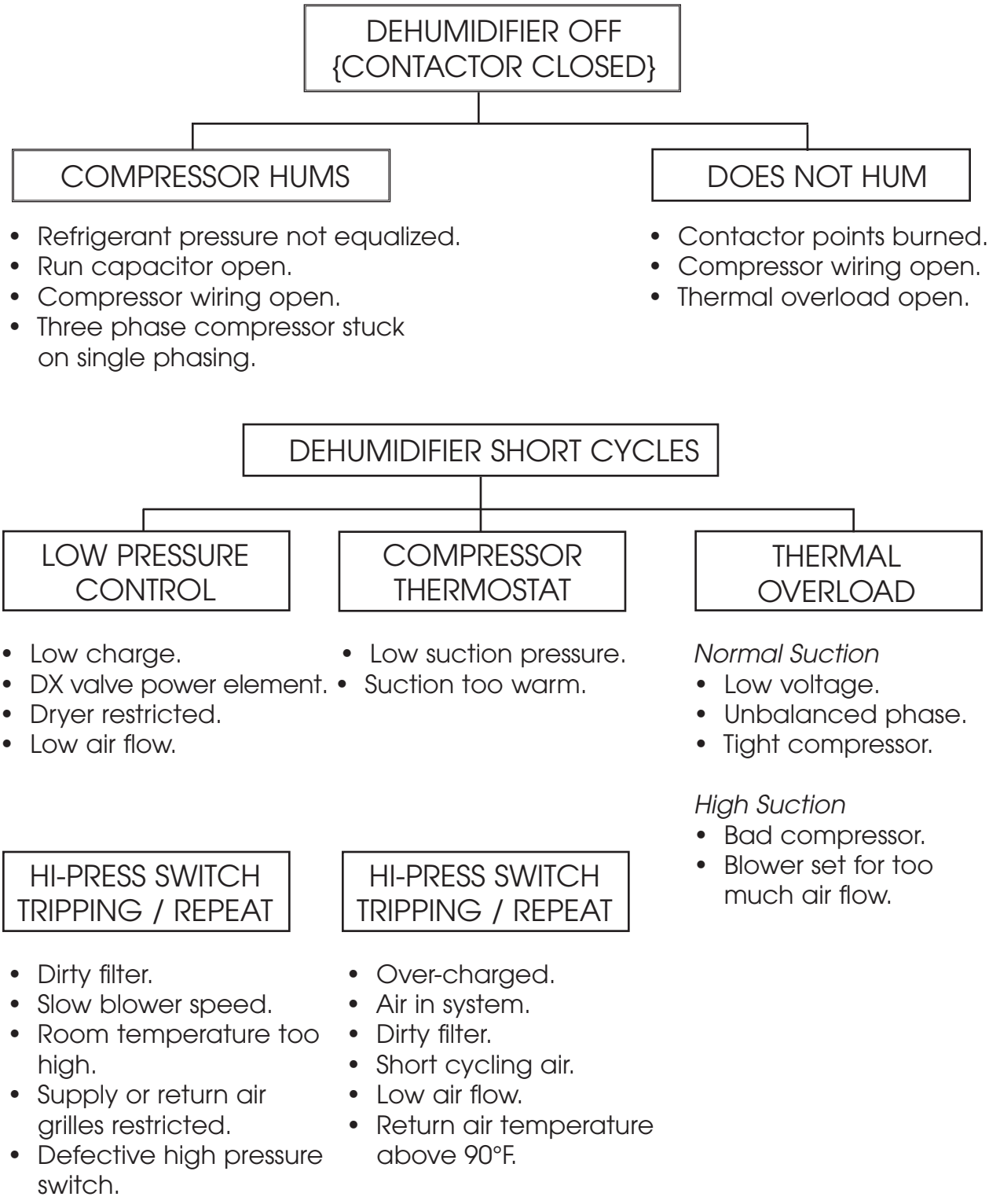
NO POWER AT HOLDING COIL

- Control wire loose or broken.
- Compressor internal wire open.
- High pressure switch open.
- Low pressure switch open.
- Compressor internal overload.
- Transformer or time delay open.
- De-humidistat control set above room condition.

NOTE: Minimum Operating Pressures

SUCTION PRESSURE 48 psi
HEAD PRESSURE 180 psi

11.2. Dehumidifier Off



12.0. Unit Operating Guidelines

12.1. Controller Set-Points

It is important to determine your comfortable set points and to avoid further controller adjustments. It takes time for the unit to establish equilibrium at a given set point. Therefore, continued set point adjustments will lead to high energy cost and user discomfort. Continuous blower operation is recommended. This will reduce air stratification and assure that the refrigeration circuit is activated only when necessary.

Recommended Set-Points:

A. Humidity 50% to 60% RH.

B. Air temperature 2°F - 3°F above pool water temperature, but not to exceed 86°F.

Warning: Never disable a dehumidifier in a pool room application unless the pool has been drained. Even when not in use, pool water continues to evaporate adding moisture to the air. The high humidity moisture will seep into walls, ceilings and furniture. The dehumidifier may be capable of regaining control of the pool room conditions after re-start, however the moisture damage to the room will become apparent.

12.2. Refrigeration Pressures

Many load factors affect the refrigeration pressures on a given day. Such factors include ambient temperature, water temperature, relative humidity and air flow. However, for the sake of trouble shooting, note the following:

A. Normal suction pressure range: 48 to 70 psig.

B. Normal head pressure range: 180 to 275 psig.

Note: Always check the system air flow before trouble shooting the refrigeration circuit.

12.3. Temperature Rise / Drop Across Unit

A. Typical air temperature rise across unit in Reheat mode: 10°F - 20°F.

B. Typical air temperature drop across unit in A/C mode: 10°F - 20°F.

Note: If your unit does not meet these temperature ranges, check the system air flow.

12.4. Pool Water Chemistry

Pool chemistry must be maintained to ensure the proper pH, total alkalinity calcium hardness and free chlorine. NSPI recommends the following levels for pool chemistry:

Free Chlorine 1.0-3.0 ppm	pH 7.4 - 7.6
Total Alkalinity 100-150 ppm	Calcium Hardness 200-250 ppm

DO NOT STORE CHEMICALS IN THE SAME ROOM AS THE DEHUMIDIFIER!

Service Problems Caused By Excessive Chemical Levels Are Not Covered Under Warranty.

13.0. SMACNA Duct Designs

When the DryAire dehumidifier is to be installed with a ducted air supply, close attention must be made SMACNA low velocity duct construction standards. Undersized or restrictive ducts reduce the system airflow, which can cause premature compressor failure. Refer to this diagram when designing ducts.

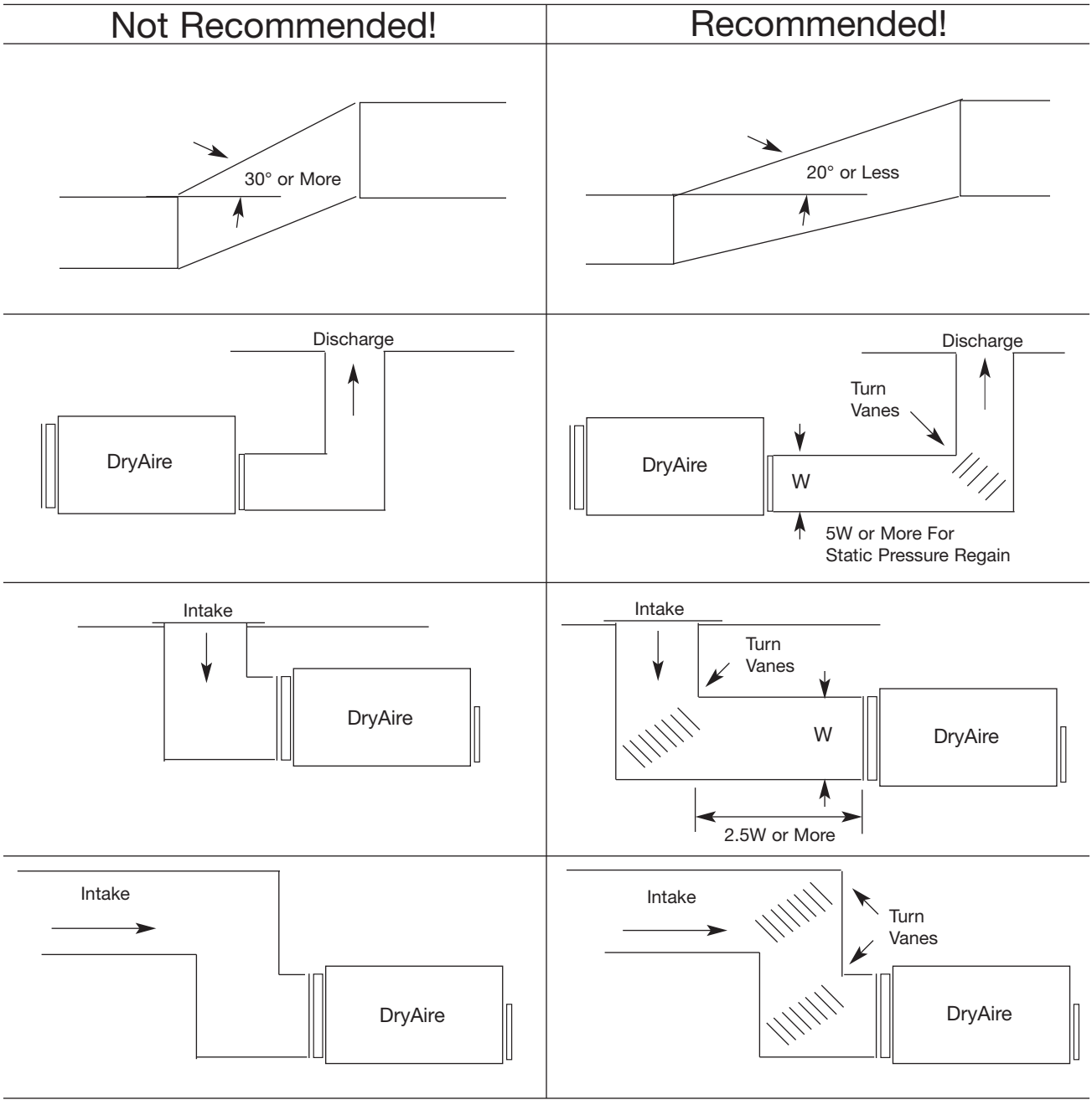


Figure 11. Recommended Duct Designs For DryAire Dehumidifiers

14.0. Outside Air Pre-Heating Requirements

DryAire Systems require that outside air be pre-heated if mixed air temperatures inside the dehumidifier might fall below 45°F. To determine if an application requires pre-heating of outside air, follow simple guide.

14.1. Data required:

A. Design return air temperature. (Industry standard is 82F.)

B. Outside air at winter design temperature. Use values as specified by design engineer, architect, or ASHRAE tables.

C. Total system CFM (dehumidifier unit) and required outside air CFM.

14.2. Determine worst case scenario for **M**ixed **A**ir **T**emperature using the following equation:

$$\text{MAT} = \frac{(\text{winter temp °F}) \times (\text{OA CFM})}{(\text{system CFM})} + \frac{(\text{return air temp °F}) \times (\text{system CFM} - \text{OA CFM})}{(\text{system CFM})}$$

14.3. If Mixed Air Temperature is less than 45°F, then the pre-heating of outside air is required.

Note: Outside air duct must be insulated to prevent condensation which may form on the exterior of the duct during cold winter months.

14.4. Example: DRY-30-230-1 dehumidifier (2200 system CFM)

Pool Room Project, 400 CFM of outside Air.

Location, St. Paul, MN. winter temperature condition -16°F.

$$\text{MAT} = \frac{(-16°\text{F}) \times 400 \text{ cfm}}{2200 \text{ cfm}} + \frac{82°\text{F} \times (2200 \text{ unit cfm} - 400 \text{ cfm})}{2200 \text{ cfm}} = 64.1°\text{F}.$$

Conclusion: No need to pre-heat outside air cfm.

15.0. Compressor Failure

Some compressors fail because they are mechanically flawed, most failures are due to system related problems. Compressor failure can be caused by air or moisture in the refrigerant system, solid contaminant's, excessive heat liquid flood back or electrical service malfunctions. To avoid repeated callbacks, you must determine the cause of the failure and then correct it.

If the compressor failed because its motor has burned out, the refrigerant, oil, and piping may have become severely contaminated. If a burnout has occurred, use the following procedure to replace the compressor and clean the refrigerant system.

YOU MUST CLEAN THE SYSTEM THOROUGHLY TO PREVENT REPEATED COMPRESSOR BURNOUTS!

15.1. Mild Burnouts (use new R-22)

If the burnout is mild, recover the refrigerant charge.

Replace the suction filter with a suction line filter-drier. Sporlan manufactures a special "HH" filter-dryer for cleaning system burnouts. These filters are equipped with a tap for measuring the pressure drop across the filter. Remove the old liquid line filter-drier and replace it with a new "HH" type filter one size larger than the original. Remove the old compressor if you have not already done so.

Install the new compressor. Be careful not to overheat its pipe stubs. Evacuate the system to remove the moisture and non-condensables from the refrigeration circuit. Check piping and joints for leaks, and recharge the system with new refrigerant.

Note: The R-22 refrigerant charge must be accurately weighed back into equipment. Refer to charging charts in this manual.

15.2. Severe Burnouts (use new R-22)

If the burnout is severe, recover the refrigerant charge. You may need to energize the liquid line solenoid valve to evacuate the circuit completely.

Verify that the TXV and solenoid valves are not plugged with debris. Clean or replace them if necessary. Replace the suction filter with a suction line filter-drier. Sporlan manufactures a special "HH" filter-driers for cleaning system burnouts. These filters are equipped with a tap for measuring the pressure drop across the filter. Remove the old liquid line filter-drier and replace it with a new "HH" type filter one size larger than the original. Remove the old compressor if you have not already done so.

Install the new compressor. Be careful not to overheat its pipe stub. Evacuate the system to purge the moisture and non-condensables from it. Check the compressor contactor for damage or pitted contacts. Some compressors are equipped with start capacitors, run capacitors, and starting relays. Check these components and replace them if necessary.

Check the piping and joints for leaks, and recharge the system with new refrigerant. Run the refrigeration system for an hour while you monitor the pressure drop across the suction filter. If the pressure drop is 3 psig or less after one hour continue to run the system for 24 hours, then take an oil sample.

If the oil sample is dirty or acidic,or if the one-hour pressure drop is greater than 3 psi, then recover the system charge and replace both the suction and liquid filter-dryers. Repeat the previous step until your oil sample tests negative.

Note: The R-22 refrigerant charge must be accurately weighed back into equipment. Refer to charging Table 4, 5 Page 38.

16.0. Refrigerant Charts

Table 4.

DryAire Model No.	Factory Charge R-22
DRY-10 SERIES	11#
DRY-20 SERIES	12#
DRY-25 SERIES	17#
DRY-30 SERIES	19#
DRY-40 SERIES	35#
DRY-50 SERIES	65#

Table 5.

MODEL	(UP TO 25')	(26' TO 50')
OC-10 SERIES	12#	14#
OC-20 SERIES	15#	18#
OC-25 SERIES	23#	28#
OC-30 SERIES	23#	28#
OC-35 SERIES	36#	40#
OC-40 SERIES	36#	40#
OC-45 SERIES	37#	41#
OC-50 SERIES	51#	57#

NOTE: THIS CHARGE IS IN ADDITION TO THE DRYAIRE DEHUMIDIFIER UNIT. CHARGE MUST BE WEIGHED INTO SYSTEM

Example:

DRY-30 Series dehumidifier	19#	19#
OC-30 Series outdoor remote condenser		
Up to 25’ of line set	23#	
26’ to maximum 50’		28#
Total R-22 Charge	42#	47#

DryAire™ SYSTEMS

Start-up Report

DRY-SERIES Dehumidification Systems Equipment

W185 N11497 WHITNEY DRIVE
GERMANTOWN, WI 53022
262/250-8500
FAX 262/250-0886
info@dryaire.com

In order for warranty to be valid, a start-up report must be completed and returned to the factory. If the report is not sent back, warranty will be voided on the equipment.

Installation Name.....

Installation Address.....

City/State/Zip.....

Model # ..... Serial # .....

Compressor Serial # ..... T-Stat # .....

Electrical Power Source ☐ 208/230V-1ϕ ☐ 208/230V-3ϕ ☐ 460-3ϕ

	Reading	Nameplate
Blower Voltage		
Blower Amperage		
Compressor Voltage		
Compressor Amperage		

Operational Data

Note: To obtain adequate readings, the room temperature must be at design condition or a minimum of 80°F and a delay of ten (10) minutes is required between every mode of operation and adjustment.

		Reheat Mode	Cooling Mode
Entering Air Temperature	°F		
Leaving Air Temperature	°F		
Head Pressure	PSIG		
Suction Pressure	PSIG		

Room Temp:_____°F. Pool Water Temp:_____°F. Duct Heater Installed:_____Y/N

Charged Outdoor Condenser R-22 _____# Pipe length from dehumidifier to condenser. _____

Company Name _____ Completed by _____

Email _____ Phone # _____ Date _____

DryAire™
SYSTEMS

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